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NEWS®

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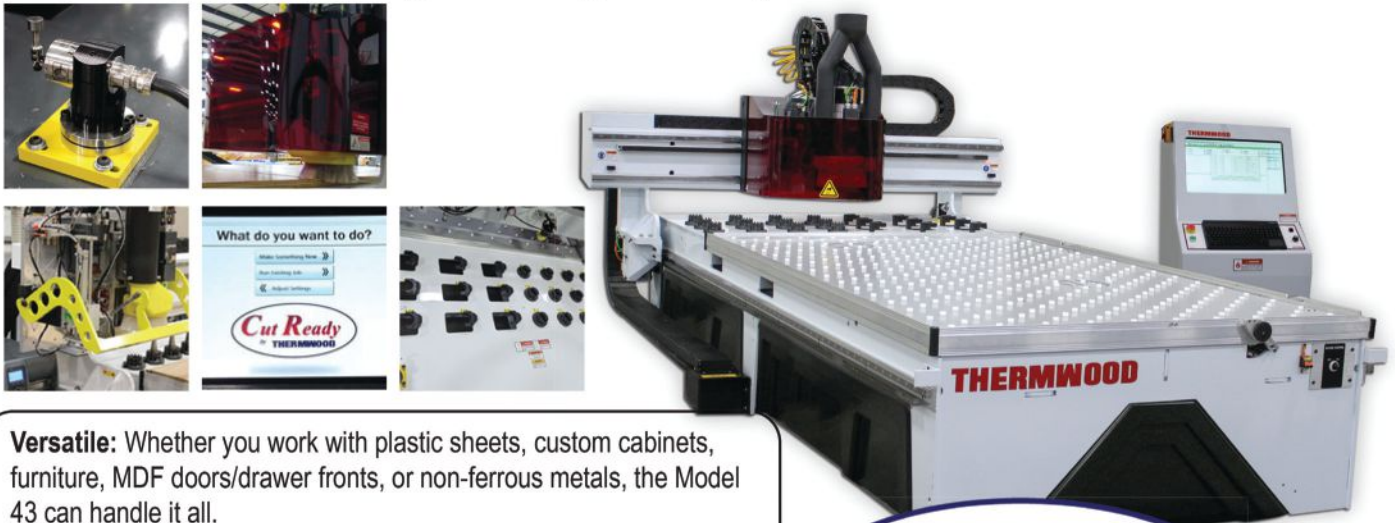
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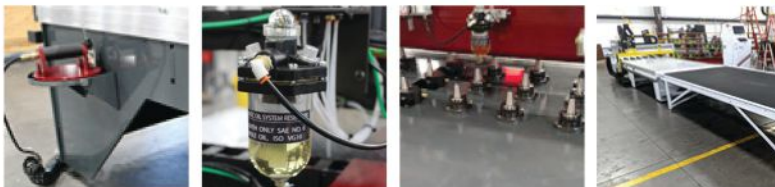
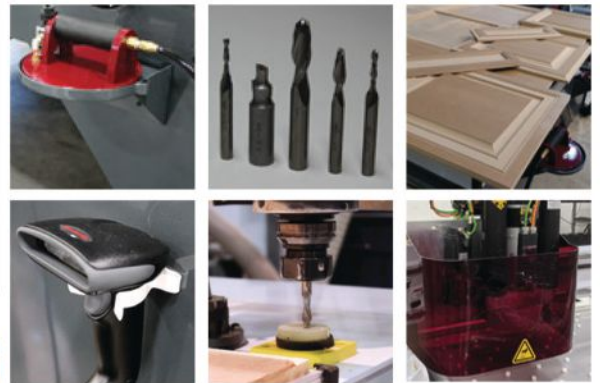
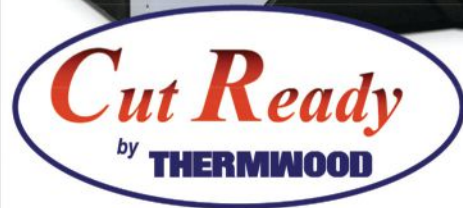
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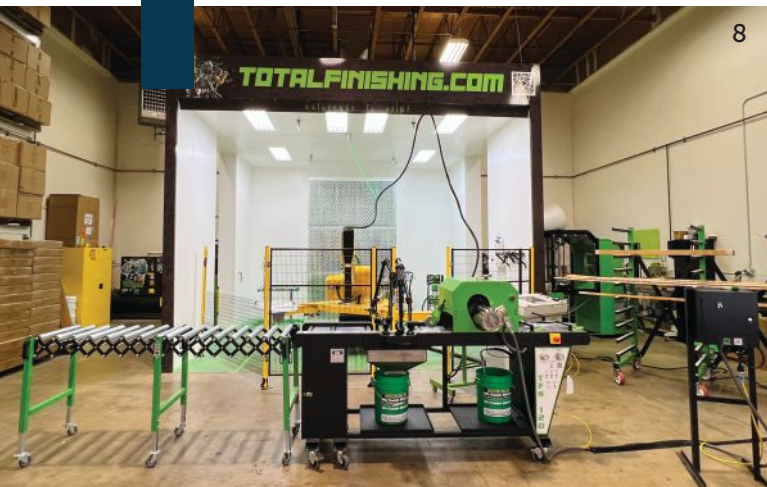
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BLOGS



Over the Workbench

Talkin' shop with former editor A.J. Hamler

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CMA launches scholarship fund

By Tod Riggio

The Cabinet Makers Association (CMA) has established the Cabinet Makers Association Scholarship Fund (CMASF), a new initiative aimed at supporting individuals aspiring to build a career in the woodworking industry.

This fund provides valuable financial assistance to those pursuing woodworking-related education or training, according to the group.

To be eligible for the CMASF, candidates must be graduating high school seniors nominated by a current CMA member. Each member is permitted to nominate one individual. Nominations must be submitted by March 1, with scholarship recipients selected by March 15. The number of scholarships awarded will depend on the funds available at that time.

Scholarship recipients will be chosen through a random draw, ensuring a fair and transparent selection process. CMA members who nominate recipients are expected to present the scholarships publicly, such as during graduation ceremonies or classroom events.

"This approach promotes awareness of CMA's support for woodworking education and fosters community recognition," the CMA said. "The CMASF is made possible through the generous contributions of CMA members and supporters who recognize the importance of investing in the industry's future workforce."

Learn more at cabinetmakers.org.

After two years of decline, annual expenditures for improvements and maintenance to owner-occupied homes are expected to grow at a mild pace throughout 2025, accord-

ing to the Leading Indicator of Remodeling Activity (LIRA) released by the Remodeling Futures Program at the Joint Center for Housing Studies of Harvard University.

The LIRA projects that year-over-year spending for home renovation and repair will increase by 1.2 percent in 2025.

"A solid labor market, rising home values, and continued improvement in existing home sales are supporting greater activity in home remodeling and repair," Carlos Martín, Director of the Remodeling Futures Program at the Center, said in a statement. "Upward trending retail sales of building materials and steady permitting for remodeling indicate that homeowners are slowly but surely expanding the pace and scope of projects compared to the last couple years."

This LIRA release incorporates new benchmark data from the American Housing Survey that revises up the overall market size.

"In the wake of the pandemic, strong gains in homeownership, record high home values and equity, and a healthy economy combined to lift improvement and repair spending to unprecedented heights in 2022 and 2023, growing 25.3 percent over these two years. The growth in actual spending was 7.5 percentage points higher than the gains originally estimated by the LIRA models over this period," said Abbe Will, Associate Director of the Remodeling Futures Program. "While expenditures are expected to grow only modestly this year, we've increased our projection for the remodeling market size in 2025 by \$30 billion, or 6.4 percent, to \$509 billion." **W**

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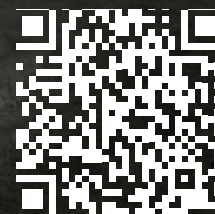


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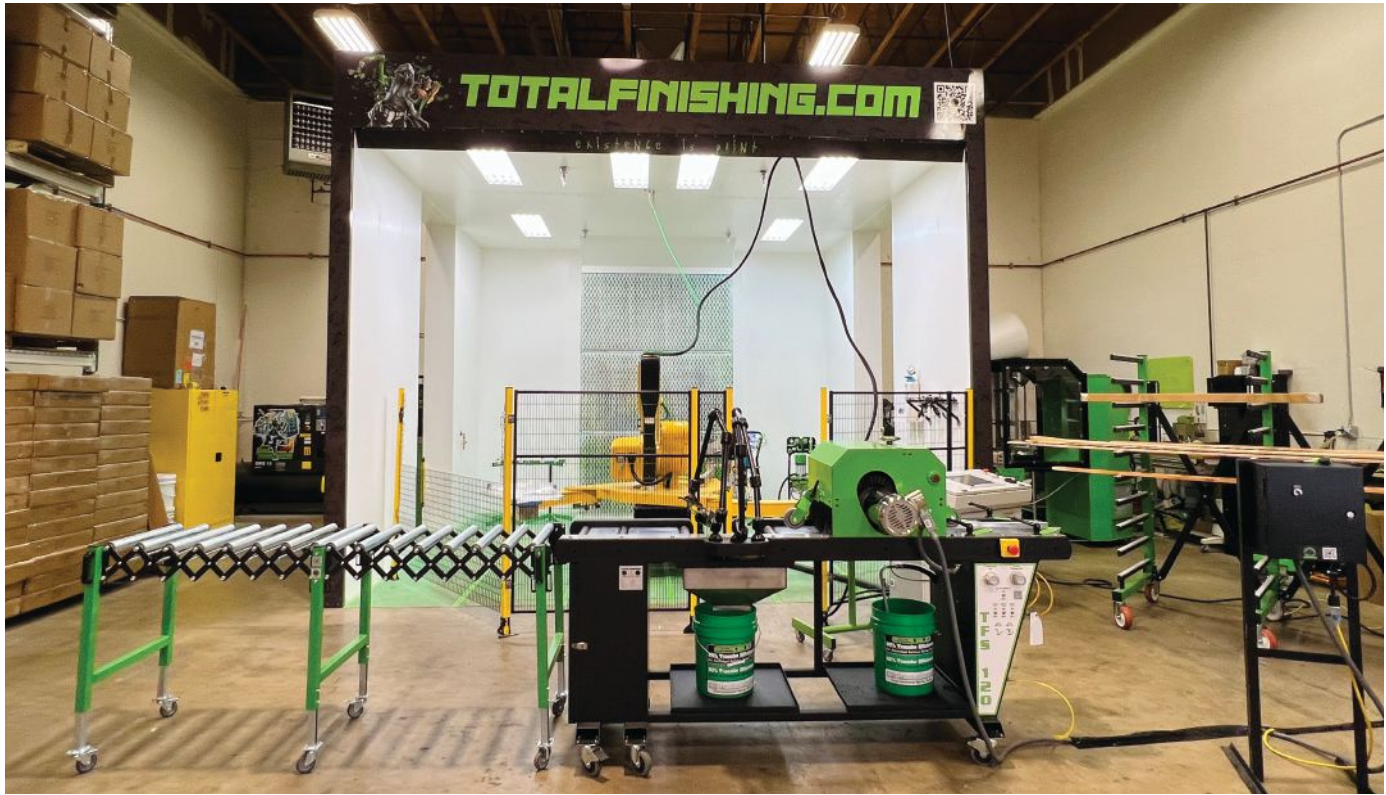
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The new learning lab in Vancouver, Wash.

Total Finishing Solutions opens finishing learning lab

By Jennifer Hicks

Total Finishing Solutions recently opened a new national finishing lab, Total Finishing School, available to all woodworking and finishing and coatings companies seeking to teach their employees about TFS finishing equipment and best finishing practices. The lab, which opened in January, is located in an 18,000-sq.-ft. space next to the company's headquarters in Vancouver, Wash.

"There's nothing like this, especially on the West Coast. There are other flatline manufacturers doing something similar, but they're all on the East Coast. We're about four miles from the Portland airport," says TFS president Ty Crowder.

"It's important to note, we are not offering a training curriculum. We are offering the space and the tools and the equipment. We're expecting that the customers will provide their

own curriculum. We're always going to show them the basics on how to use the equipment, but any company using any brand of coating can come here and get the same treatment.

"So, for example, employers of woodshops can send their employees and their coating products, and we will show them how to properly use, maintain, clean and operate any of the equipment here."

About half of the space is comprised of two main liquid bays, dedicated to horizontal and vertical finishing. The horizontal finishing side includes the company's signature and award-winning VD Simple Dynamic flatline spray machine with load and unload system. This space also features the company's Total Cure infrared oven for water-based and solvent finishes. There's also classroom space and training bays

for powder coating applications.

"Essentially, we can spray anything and cure it right here in the lab," says Crowder. "We have some downdraft tables and a full variety of surface prep abrasives, and all the tools, so when we do a classroom, it's like a one-stop shop. We also have a warehouse with all our pumps and guns, and we have a showroom with probably 75 different manual and automatic spray guns."

Fees are based on lab time, equipment used, and other factors.

"We've already had about four to five companies come through and spend the day here. For example, we had an aerospace company come in that brought some experimental coatings and pre-surface treatments," adds Crowder.

Learn more at totalfinishingsolutions.com. **W**

CMA to hold its National Conference in Detroit

By Jennifer Hicks

The Cabinet Makers Association (CMA) will hold its National Conference on Oct. 1-3 in Detroit. Intended to help members elevate their craft and enhance their business practices, the conference will feature educational and social events.

In keeping with its mission statement, the CMA encourages members to attend the conference with their peers for an enriching experience.

"The Cabinet Makers Association was incorporated in 1998 by a group of custom cabinetmakers who thought the industry's smaller

shops needed to network and help each other grow profitably," the association states.

"Today the CMA is where collaboration, not competition, drives success. We provide unparalleled education through shared industry experiences, empowering woodworking professionals to excel in craftsmanship and business."

The conference will feature keynote presentations from Michael Fuez of ITR Economics and Marc Sanderson of Innergy; educational sessions that will explore the latest industry trends, techniques and best practices; local plant tours, and networking opportunities for attendees to connect with fellow professionals, share knowledge and grow their in-



dusty connections.

Attendees may also participate in American Red Cross training as an add-on session on Oct. 1.

Registration is open with early bird savings available before March 31. Learn more and register at cabinet-makers.org. **W**

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Outlook on teak is bleak

By Jennifer Hicks

The availability of genuine teak (*Tectona grandis*), also known as Myanmar or Burmese teak, is scarce. The dense and durable exotic hardwood, known for its ability to withstand harsh exterior conditions, is very difficult to find these days because imports are currently restricted in the U.S. according to suppliers interviewed by Woodshop News.

The good news is there are several suitable alternatives offered at a much lower price point.

"Basically, the Burmese teak or the genuine teak, we cannot get into the country right now because we are not trading with Myanmar, which is where it comes from, because the military overthrew the government," says Carl Mahlstedt of Goosebay Sawmill and Lumber in Chichester, N.H. "Since then, the teak supply has been dwindling, and just recently, one of my suppliers told me there's basically nothing coming into the country.

"There's always been supply issues with it, being that's the only place to get the genuine teak. So, it's always been very volatile and very expensive even when it was available. With the trade issue, the price basically doubled, and now it's just not available anymore."

Mahlstedt offers alternatives such as iroko (*Milicia excelsa*), ipé (*Handroanthus serratifolius*), and plantation teak.

"Iroko, also called African teak, it's not really a teak species but it looks like teak," he says. "It just doesn't have the same rot resistance, so it doesn't last as long. Usually people use it for interior boat projects or things that weren't directly in the water. We sell it for around \$10 a board foot, which is a fraction of the genuine teak price.

"Something more rot resistant is ipé, used in decking. It has a darker brown color similar to teak. It's just a lot more dense and harder to work with. The closest would be plantation teak, which is technically the same species but grown in South America, so it has always been considered



a lower quality than Burmese teak."

Dave Norman of Parkerville Wood Products in Manchester, Conn., says there's still demand for genuine teak.

"When you're talking about woods that are good for exterior projects, teak is at the top of the list because your yacht builders and boat builders use it. But it's also something people like to build cabinetry with. It's not easy though because it's really oily, so it likes to repel glues and finishes. It's a difficult wood but it's one of the only ones that can really suit certain projects. A lot of towns and municipalities will buy it for benches and things because it will last so long outside," says Norman.

"But here's the deal, if you look up teak, you'll quickly find out that it hasn't been able to really be brought into the country for last couple years because of the political unrest with Myanmar. It's really hard to find teak, and I've got people calling here all the time. The 5/4 is non-existent at the moment, so you've got to go to 4/4, 6/4 and 8/4, and again, it's heavily sought after because a lot of these big ships and yachts, that's the only go-to."

Parkerville offers afromosia (*Pericopsis elata*) and iroko as alternatives.

"Right now, on the retail market, teak is around \$50 to \$60 per board foot, and that's extremely high for a lot of these woods and it adds up very quickly. If you go to a substitute, afromosia, which a lot of people have not heard of, it looks almost identical to teak but it doesn't hold up as well. But if you're doing an interior project, cabinetry or vanity, it's perfectly fine, it suits the needs, it's a lot less expensive and it glues up better, so it's all a win/win." **W**

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AWFS changes rules for Fresh Wood competition

By Jennifer Hicks

The Association of Woodworking and Furnishings Suppliers (AWFS) has updated its official rules for the 2025 Fresh Wood Student Competition with new originality guidelines and an age limit, now set at 35 years, to encourage emerging talent to participate.

The AWFS said these changes underscore its commitment to fostering innovation while protecting participants' original work, making the Fresh Wood competition an invaluable platform for young professionals entering the woodworking industry.

"The Fresh Wood competition has always highlighted the creativity and skill of student woodworkers, and these updates will continue to support those values," Angelo Gangone, Executive Vice President at AWFS, said in a statement. "We're excited to see this year's entries and support the next generation of woodworking professionals."

The competition, which will take place July 22-25 at the 2025 AWFS in Las Vegas, invites U.S. high school juniors, seniors, and post-secondary students in woodworking or related programs to showcase their design and craftsmanship. There are two divisions, High School and Post-Secondary, and six competition categories for each division, including Seating, Tables, Case Goods, Design for Production, and Open.

The new rules state that projects must be original designs. High school entrants must be in a woodworking or design program, have the support of their instructor and school or program where their work was completed, and must be 15 to 19 years old by July 22, 2025. Post-secondary entrants can be full- or part-time students but must be seeking a degree or certificate in a woodworking or related program and considering a career in woodworking or design. They must be 18 to 35 years old by July 22, 2025.

The entry deadline is May 2. For complete rules and registration, visit awfsfair.org/fresh-wood. **W**



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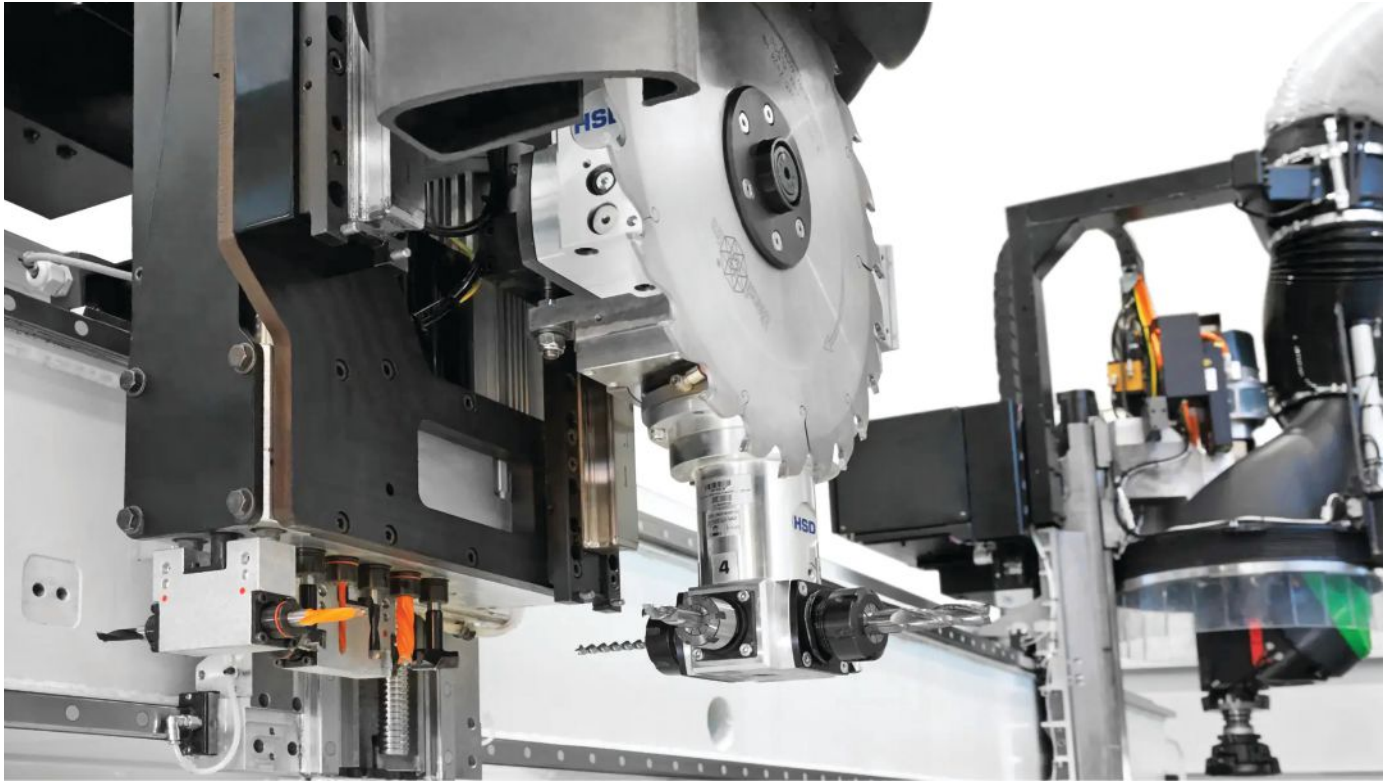
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Multifunction units on the new Rover A Plus from Biesse offer an interesting automation option for smaller woodshops.

Putting machines to work

Adding automation can reduce waste and improve efficiency

By John English

Automation simply means using more machines, rather than humans, to move, cut, shape, coat and assemble.

Anderson America (andersonamerica.com) aptly describes the benefits of its automation options as high-speed processing, versatile material handling, advanced vacuum technology, and user-friendly interfaces.

The possibilities for automation are constantly growing, and ironically that means there's no sweet spot where a woodworker can finally look at the shop and say that it's now as automated as it needs to be. For smaller shops, this evolution can be challenging. The owner needs to constantly review what's new and update accordingly, and that takes time and money. The goal is to commit to an investment that will reduce waste and improve efficiency, while paying for itself quickly. That can be elusive, and the only answer is to perform due diligence when researching.

CNC AUTOMATION

A common dilemma for woodshops looking to automate is whether to center the effort around an existing machine or invest in a new CNC. The first choice means adding after-market options such as load/unload, tool changing, vac-

uum clamping and automated positioning. The controls, motors and spindle may need to be updated on an older machine too, which of course adds to the investment. But if it's a solid, familiar machine and there's enough floorspace to add automated feed and retrieval, there's an argument to be made for leaving it in place and upgrading – especially if it's paid for.

If the shop decides to go with a new CNC, it's important to keep in mind that the manufacturer probably won't be able to supply every element of an automated production line without integrating third-party software and controls. A good example of this was the U.K. launch last fall by **AXYZ** (axyz.com) of its new Woodworker CNC. The company shared the event with software provided by Hexagon's Cabinet Vision, vacuum material moving cranes and lifts from Schmalz, and labeling from InktEc. Because AXYZ works with these and other partners, the new CNC already has a level of built-in compatibility. That makes it easier to add automation options as needed, such as drill banks, label printers, a rotary axis, aggregate heads, vacuum pods, drills and spindles.

In September last year, **SCM Group** (scmgroup.com) unveiled its new Morbidelli x50 and x100 CNC machin-

ing centers. The x50 (which, by the way, has a clever new deflector that evenly distributes vacuum across the entire worktable) was designed for shops that are taking their first step toward automated nesting technology. The other machine, the x100, meets the needs of a shop looking for flexible and batch 1 production. It delivers sophisticated vacuum management options along with pods that reference the cups and parts with a laser, and Smart Cut, which applies an algorithm to the cutting sequence in nesting to improve clamping.

The small Rover A and the large Rover B are two routers from **Biesse** (biesse.com) that have proven themselves over time. Now the company has added the new Rover A Plus, which is a twin-head machine that's not as big or costly as a Rover B but still has the capacity for up to 83 tools. For a smaller shop implementing or upgrading its level of automation, the second head is equipped with multifunction tooling such as a dedicated unit for vertical routing operations, an aggregate for horizontal machining, a blade, or perhaps a drill head. Every time the main head requires a tool change, the multifunction unit picks up the slack. That can save downtime while reducing the number of tool changes needed, and also the number of tools.

To automate sheet breakdowns and build parts, **Castaly** (castaly-cncmachine.com) has a new entry-level CNC called the Artisan that has an eight-tool changer and a six-zone vacuum table.

Shops looking at purchasing their first CNC might also



This ARmony robot from Stiles unloads a nested based router, buffers parts, and loads them into a drill and dowel machine.

benefit from an article on the **C.R. Onsrud** website, cron-srud.com, titled "Top 10 Considerations when Buying a CNC Machine for Composites". It's in the Blog section and is quite comprehensive.

And **Felder** (felder-group.com) now offers a CNC portal milling machine called the Hammer HNC3 825 which was specifically designed for small shops and schools. The worktable options are roughly 32" x 19" or 51" x 30", with 6-1/2" of Z height.

Automated feeding isn't limited to full sheets of MDF. **Cantek America** (cantekamerica.com) now offers an automated strip feeder for its MX370PW edge bander that lets

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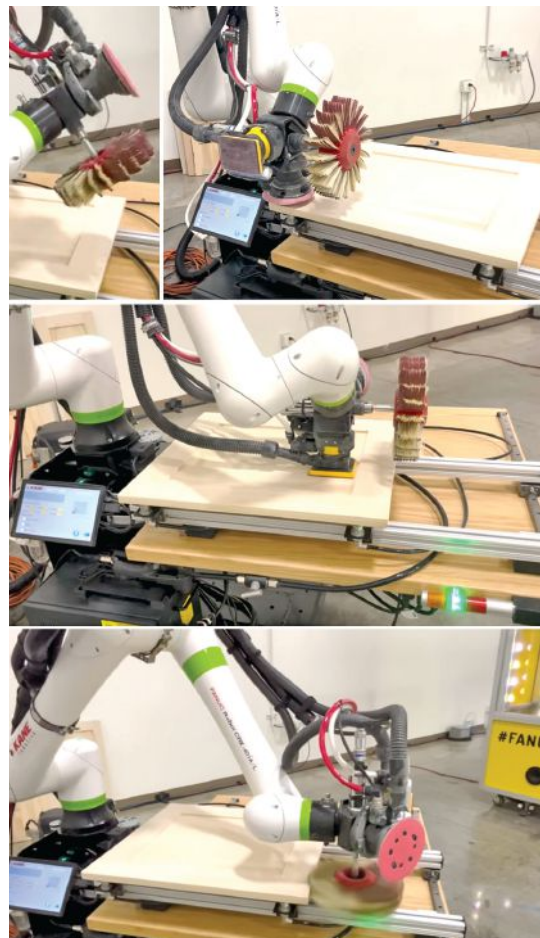
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New CNC centers from SCM Group include the Morbidelli X50 and X100.



A YouTube video by Kane Robotics shows a Fanuc CRX cobot sanding the frame, panel and edges of a door.



Three variants of the newest Zentrex beam saw from Holz-Her USA offer shops a choice for automated panel reduction.

the woodworker load a stack of solid wood or laminate strips, and the device will then feed them to the bander one after another.

A new automated work center, the Jet Master RT/C, was launched by **Casadei-Busellato** (casadeibusellato.com) in 2024. It's now available in 3-, 4- and 5-axis versions with parts unloading. The RT/C is compact and flexible, comes with an innovative safety system with bumpers, and has 7" of Z clearance.

For larger shops looking at a beam saw for automation, the newest Zentrex 6215 from **Holz-Her USA** (holzherusa.com) offers a 7" scoring blade, more than 5" of main blade protrusion above the table, automated fine adjustment with a memory function, optional speed control, and the latest dust control technology. This saw also has a laser positioning system and intelligent clamps.

Other reputable sites to check online when researching automation options are **Inventables** (inventables.com), **Kern Laser Systems** (kernlasers.com), **Laguna Tools** (lagunatools.com), **Larick Machinery** (pillarmachine.com), **Legacy Woodworking Machinery** (legacywoodworking.com), **Techno CNC Systems** (technocnc.com), and **Thermwood** (thermwood.com).

COLLABORATING WITH ROBOTS

Many of the advances in robotic automation are incremental. That is, they involve a series of tweaks to some control software or app, or perhaps a new tool or profile.

But some advances are profound, especially those driven by artificial intelligence. The ability of palm sanders held by robotic arms to follow contours and curves is a good example. Another is the option of programming tools to travel in random directions and ranges, such as robotic spray guns that are no longer limited to movement in X and Y. A human can spray a complex object such as a grand piano case, and a robot can track the person's movements and then duplicate them.

When two or more people work together on a project, they're described as collaborating. When we start talking about machines collaborating with humans, it begins to sound like science fiction. It's also a little spine shivering because of all those futuristic thrillers that have predicted the rise of robots in a negative way. The truth is that collaborative robots are already well established in woodworking, and they help shops send jobs out the door faster and with fewer defects.

A collaborative robot (cobot for short) is a lightweight and flexible programmable arm that is designed to share a workspace with humans and be able to avoid bumping into them or doing them any harm. These are not the massive industrial units that build battleships and airplanes. For the most part, they're single moving arms with a specific and limited range that describes how far they can reach and how much weight they can carry. The working end of the arm is fitted with a tool such as a router, sander, clamp or spray gun. The arm is infinitely more flexible

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The Jet Master RTC automated work center from Casadei-Busellato is now available in 3-, 4- and 5-axis versions.



The new Woodworker CNC from XYZ was launched with industry partners that help streamline the automation process.

than a human one, often having knuckles/joints that can swivel 360 degrees in more than one plane.

Cobots have a small footprint so they can fit beside or between machines without eating up floorspace. They can be wall, ceiling, table or floor mounted, and a few are even secured to carts, trolleys or moving platforms on tracks to increase their versatility. Their main job in the woodshop is to do all of those tiring, repetitive tasks that employees hate, such as sanding or installing hardware. But their value doesn't just lie in the tasks they can complete. They're also valued for the time that they can free up for humans, who can then spend those salvaged hours being creative in unique ways that a cobot can't.

Another salient advantage of cobots is their customizability. When one thinks of robots, the image is of indus-

trial lines producing vast numbers of identical parts or performing a single task ad infinitum. But cobots can do one thing, switch to a second or third task, and then come back to the first if needed. That lets them work with a range of items, such as differently sized cabinet doors or nested panels. There's an interesting video on YouTube (type x71Q0jbl0CM in the search bar) that shows a Techman Robot in a small woodshop flat sanding on a workbench, then edge sanding on an oscillating sander, and finally unloading and stacking parts from an edge bander.

Cobots are also appealing because they don't cost a lot when compared to the price of hiring and training a human who needs coffee breaks and lunchtimes and vacations and sick days. Plus, they won't seek or accept a job from a rival shop that can afford to pay a little more.

One of the main strengths of these collaborators is that they bring precision to repetition. They can be equipped with a drill, router, sander and so on, and programmed to very minute parameters. That is, they can sand very lightly or barely skim a surface with a router bit, acting as needed in the manner of a fine craftsman.

Among the best resources for woodshops looking at cobots are **Universal Robots** (universal-robots.com) and **Fanuc America** (fanucamerica.com). **Stiles Machinery** (stilesmachinery.com) also offers heavier duty robots such as the Automatech ARbeat and ARmony for whole and partial sheet material handling, loading and unloading of parts and numerous production level tasks.

Other research leads for cobots and robotic tools include **Machine Tool Camp** (machinetoolcamp.com); **Dynabrade** (dynabrade.com); **Maple Advanced Robotics** (maplerobotics.com); **OnRobot** (onrobot.com); **FerRobotics** (ferrobotics.com); **GrayMatter Robotics** (graymatter-robotics.com); **Epson** (epson.com); **SageRobot.com** (sagerobot.com), which specializes in solid wood automation; and sanding solutions from **Mirka** (mirka.com).

For more detailed information on the different kinds of robots and cobots, visit woodshopnews.com. **W**

Kreg adds the Dust Separator

By Jennifer Hicks

Kreg Tool Co. presents the new Dust Separator, a low-cost option for controlling dust and debris in the shop.

The Dust Separator fits over most five-gallon buckets and connects to a shop vacuum. It captures most of the dust and debris in the bucket, which improves the vacuum's efficiency, reduces clogs in the hose, and extends filter life, according to Kreg.

"Whether you're a woodworking hobbyist or a pro, the Kreg Dust Separator is designed to elevate your shop's performance," said Jerry Rosenberger, Kreg's director of product management. "It not only improves air quality but also minimizes downtime from filter changes, creating a cleaner and more productive shop environment."

The lid is made from a transparent plastic polymer, helpful for checking the fill level. It comes with a 90-degree swivel hose connection, 3' of flex hose, and two 2-1/2" hose fittings.

The Dust Separator, recommended for use with vacuums rated at 5-hp and higher, sells for \$59.99. Learn more at kregtool.com. **W**



Courtesy of Kreg Tool Co.

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REHAU adds new colors to Rauvisio Terra HPL line

By Jennifer Hicks

REHAU North America, a provider of polymer-based solutions for the construction and other industries, recently expanded its Rauvisio Terra soft, textured HPL (high pressure laminate) surface line with five new colors that reflect a market shift towards warmer tones, according to the company.

"As market trends shift from cool gray to warm tones, we've refreshed the Rauvisio Terra line by updating our color palette," said Jesse Collins, REHAU's director of marketing and communications.

"We're excited to introduce five new colors that help our customers design entrancing natural spaces. Fireside Walnut offers a rich, true walnut shade that blends comfort and sophistication, beautifully complementing Pantone's Color of the Year, Mocha Mousse. Soundside Oak, Light-house Oak and Sundial Oak all epitomize the honey trend. For those who prefer gray, Midsummer Elm provides a fresh take with warmer undertones."

Launched in 2017, Rauvisio Terra features an authentic wood look, plus superior durability and chip-resistance compared to TFL and melamine, according to the company.

Rauvisio Terra is offered as laminates, boards and edge banding, as well as fabricated panels and cabinet doors with matched REHAU LaserEdge. Boards and fabricated components come standard with a particleboard core and are laid up with PUR glue.

Learn more at rehau.com/terra. **W**



Shop owner creates Bossglue

By Jennifer Hicks

Nick Starrett, owner of Nick's Custom Woodworks in Hilliard, Fla., has developed a new wood glue, Bossglue, to meet multiple needs in the shop.

"I've been a full-time furniture maker for about a decade, and over the years I've used just about every wood glue that's out there. I always liked different aspects of glues, like the viscosity from one glue, the bond strength from another, assembly time...but none of those were in the same bottle. So, I set out on a little venture to see if I could create my own version of what I thought would be the perfect glue," says Starrett.

After realizing he couldn't just brew a new glue in his shop, Starrett found a local adhesive manufacturer that specialized in custom formulas. He worked with their chemist for about a year and tested different formulas in his shop.

"We finally reached exactly what I wanted and that was our first glue, which is our tan drying wood glue with the features I wanted like the bond strength and for it to be non-toxic and FDA-compliant for indirect food contact. Also, the assembly time was important. Ours is about 10 to 15 minutes, a tad shorter than say Titebond III, closer to Titebond II. And the viscosity was a big thing – you don't want it to be too runny or too thick – so we settled on a viscosity of 4,000 CPS (centipoise).

"Another big aspect we wanted to change was the glue bottle cap. Those get clogged up really easily after you use them, so we added our easy open twist top that doesn't get clogged up and allows you to control how much glue flows out of the bottle."

The glue is available in three colors as well as 2-, 8.5- and 16-ounce bottles, one-gallon jugs, and 55-gallon drums.

"Our first glue was our tan drying glue, a neutral color that blends in with the majority of species in your workshop more than say a yellow tinted glue. Then we did another that dries crystal clear which is now our most popular, and our dark brown which dries very similar to color of a walnut," says Starrett, president of the Bossglue Co.

The company offers sample sizes, accessories and more at bossglue.com. **W**

Techno CNC updates LC Series

By Jennifer Hicks

Techno CNC introduces the next generation of its LC Series CNC router. The original LC Series was developed in 2001 and later discontinued due to the rising costs of parts. In recent years the company has strived to bring a fresh version back to the market at a low price point.



"It has become our mission to bring back high quality goods at a low cost; everything our LC Series CNC machine has stood for, since the very beginning of Techno," says Techno CNC president Roy Valentine.

"After Covid-19 hit, prices skyrocketed worldwide, [with] inflation hitting new highs and even the basic necessities becoming unaffordable. This affected our business models and forecasts as the supply chain crunch took hold. Machinery, accessories, and parts became expensive to ship worldwide and were inaccessible.

"Now, five years post Covid-19, recognizing that companies are seeking low-cost solutions, Techno has officially brought back an economical system for our customers."

The new machine features all-steel construction and new ball screw technology. Available in two sizes,

4x8 and 5x10 with a 12" gantry clearance, standard features include a 12-hp automatic tool changer, eight-position tool rack, and pneumatically operated high-vacuum hood.

Other features include a four-zone vacuum T-slot table with a 10-hp rotary vane vacuum pump, digital AC servo motors and drives, precision linear rails and bearings, and an intuitive handheld controller.



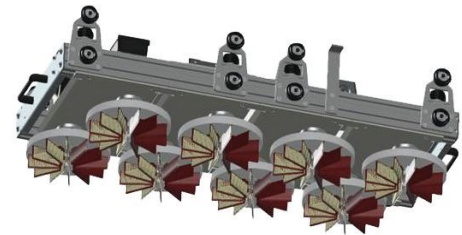
Techno's new LC Series CNC router starts at \$35,000. Learn more at technocnc.com. **W**

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FINISHING



The many factors affecting color shift

By Diane Shattuck

It is always amazing to me the multitude of ways our color can shift when working with wood.

The process is influenced by several factors and there are bound to be surprises and challenges along the way. This is why a step panel or storyboard is so essential to develop and achieve consistency when trying to keep our color from shifting.

What are some of the things that can cause our color to shift?

The wood's tone sets the stage, influencing every layer of color that follows. To get a good look at the natural tones, just wipe some mineral spirits on a raw board. The grain and texture of the wood will also react differently with environmental influences and different stain systems. The wood's cellular structures affect every step or manipulation we perform. Temperature, humidity, and moisture content will also affect the color shift as it influences the cell's ability to absorb a stain or dye.

Numerous other color shifts can happen when staining the same board. A knot, for example, can give you an optical illusion of dark and light color simply from a viewing angle due to grain pattern or texture. Wood that is distressed or textured by knife cuts will also experience color shift.

How the wood is sanded will affect color shift. Wood that is sanded smooth will lighten the color, while a rougher sand will shift the color to a darker tone. This is all due to the way the color medium can penetrate into the wood and reflect its color. If you are trying to achieve uniformity of color on solid wood and veneer substrates, switch up the grit sequence to match the color's ability to pen-



The colder the substrates, the harder it is to achieve an even color, flow of finish, sheen, and adhesion. This picture shows the same board cut in half, sanded and stained the same. However, the temperature of the boards are 40 and 80 degrees F. The colder board (left) appears very blotchy and has uneven color.

etrate and even the hue. Solid wood will require one to two grits lower to achieve the same color as a veneer mounted on plywood.

Clear sealers and topcoats affect our color development based on their chemical makeup, raw materials such as resins, water or solvents, etc. Some coatings, although clear, can have an amber cast to them, thus changing our colors appearance with each coat applied. This is why a finished storyboard or step panel is crucial to be sure the end color is correct. Working with an amber hue clear coat can help create more depth with darker tone stains but really kill the purity or clarity of a white stain.

The sheens we choose can bring out different tones in our finishes and shift color. Higher sheens like gloss make our colors warm and may depict yellow, while lower sheens depict cooler tones. Lighting will also change the color's appearance.

Color shifts will also happen with paints and primers. Remember that every color is influenced by the color underneath it. When priming wood, the primer will shift in tone based off the color it is covering and hiding. Primers are made to hide and fill. Manufacturers use different formulas and raw materials in their primer line, so the color hue can change from one to another.

When using a dark pigmented color, say blue, the color will shift with each layer and when placed over a different base coat. Dark colors tend to shift more than a pastel color because they are mixed in a clear tint base that requires more layering to achieve the true color you are after. Many times, darker colors also tend to be harder to work with due to tint load.

When working with tinted coatings that require a catalyst, many times you can experience color shift once the coating is catalyzed.

Mixing of your materials can cause color shift. Thoroughly mixing stains, glazes, pigmented coatings and even clear coatings is paramount. All materials should be frequently, consistently, and routinely mixed to retain consistent distribution of all pigments, resins and flattening agents.

When storing unused finish, be sure to seal the lids securely to avoid evaporation, which will cause a color shift with the next application. To prevent this, store the cans upside down. The pigment will settle on the lid, but it can be easily scraped off and agitated back into the material.

Proper dry time is paramount for consistent color, structural performance, and the integrity of the finish. Different dry times or dwell times of the stain and dyes can be jeopardized when the finish is applied too early due to the solvents possibly blending together and diluting the color's appearance. Do not rush the process. The order of application, dry times and layering must be consistent. Changing up systems or skipping steps will always cause a shift in color and appearance.

Developing the color system is a crucial step. Each component will influence or be influenced by each sequential step. Layering color creates depth, richness and uniformity.

Color shift is a daily occurrence. Knowing some of the devils in the detail that can appear while trying to get the color you are after will help ease some of the pain and shift from happening.

In next month's column, I will discuss the differences between choosing a stain or dye. There are several types to choose from, and each has its own unique way it colors or affects a wood's tone. The types of pigments and binders, application methods, and dry times all influence the color. Change any one of these and you have color shift.

Remember, always trust and respect the process. **W**

Diane Shattuck is a finisher, consultant, guest speaker, writer and teacher. She can be contacted at dianeshattuck@msn.com. Questions, suggestions and comments are always welcome.



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Working with finishing equipment

Best practices, pointers and tools for success

By John English

Different coatings have different viscosities, and that's the prime variable that determines how they'll behave when they're being delivered to a surface. Viscosity describes a liquid's resistance to flowing, while its opposite, fluidity, is the ability of a substance to flow easily. There's a temptation to think of viscosity as 'flowing', while it actually means the reverse.

Viscosity is defined as "a force multiplied by a time divided by an area". In a spray booth, it's measured by how long a specific amount of liquid takes to move through a defined orifice with gravity being the force. The rate of flow is calculated using a unit called a centipoise (cP), where water has a value of 1.00. Air is 0.02 (50 times as fluid as water), while acetone is 0.30. The viscosity of oil is a lot higher. The thickest oils can be up to 900 cP, or nine hundred times as thick as water. A good visual here is that honey is somewhere between 2000 cP and 10000 cP, depending on its water content. So, even thin honey is 2,000 times more resistant to flowing than water.

CHANGING THE FLOW

Water and waterborne products have low viscosity, so they flow easily through a spray gun. But when a carrier (oil, water, solvent) or a pigment (coloring agent) contains a high level of solids, that increases its viscosity. There are then three ways to improve its flow. It can be thinned, or the nozzle can be changed to one with a larger orifice (hole), or the air pressure can be increased. The answer is usually some combination of the above, and temperature also plays a role. The optimum temperature for spraying is around 75 degrees F, and many fluids are quite sensitive to variations. Heat honey in a microwave and it flows a lot easier than when it comes out of a fridge. The same is true for solvents and oils.

Viscosity and fluidity also determine the way that a coating accumulates on a surface. Fluids with high viscosity reduce both the spray angle (the size of the pattern) and the flow rate (the amount of material being delivered). So, if the orifice is too small or there isn't enough PSI pushing it, the gun will spray a small, poorly distributed and lightly concentrated uneven pattern. As the liquid is thinned the flow will increase, and the pattern will improve. But the coating on the wood will be thinner, so it may need more drying time (depending on the carrier – oil, solvent or water) because it will need more coats. Thinning also affects glaze and durability, so check the coating manufacturer's recommendations for limits.

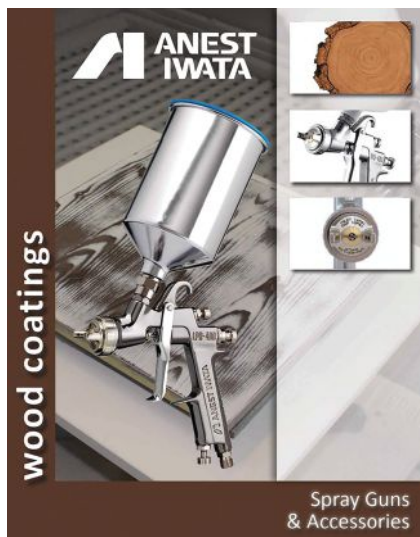
Keeping up with technology is a challenge in this field



The Fpro P gun from Sames.



SATA's new Jet X gun, which features the company's labyrinth airflow system.



Anest Iwata's online Wood Coatings spray gun and accessories catalog has a nicely illustrated guide to cleaning spray guns.

because it moves so quickly. For example, **SATA** (sata.com) has introduced a new Jet X gun with a nozzle that uses a labyrinth airflow system. This guides the air in the nozzle in such a way that it exits each orifice at exactly the same pressure, free of turbulence and pulsation, to deliver homogeneous atomization.

Atomizing a liquid makes it airborne. Atomizing means breaking down a liquid into tiny droplets by using compressed air to force it through an orifice and allowing that airflow to carry the droplets in a specific direction toward the wood. It's not literal: the droplets are nowhere near as small as atoms. The nozzle orifice, air pressure, and viscosity all play a role in how well the gun atomizes. In general, the finer the spray the more even and controllable the application will be. But if it's too fine it won't remain in suspension within the air stream, so it won't travel all the way to the wood in the desired direction.

The **Sames** (sames.com) Fpro P has a paint speed controller and a spin effect that atomizes with a very high transfer efficiency. And the company recently added compatibility for BSP and NPS fittings to its Fpro P manual spray gun. BSP/Whitworth threads have a 55-degree angle and NPS/Sellers threads are at 60 degrees.

There are numerous ways to measure viscosity. Finishing profes-

sionals use special cups (DIN, ISO, AFNOR, ASTM and Ford are popular versions) that allow a liquid to descend through an orifice while it is being timed. The result (in seconds) can then be converted to centipoise values.

With all the science available, it's ironic that the quickest way to find the perfect spraying combination on a small job is old-fashioned trial and error. Experienced woodworkers will visually evaluate (ok, guess) the viscosity to get close, and then experi-

ment with a narrow selection of different nozzles to see which one delivers the best pattern. If you're doing that, it's advisable to keep records. By recording which type of liquid is being used, the temperature in the spray booth and the chosen nozzle, a shop can build up a data sheet that lets an employee quickly choose the right combination of gun, nozzle and pressure for each type of coating. Product data sheets for most finishes also list viscosity, gun set-ups and PSI setting recommendations. If a coatings sup-

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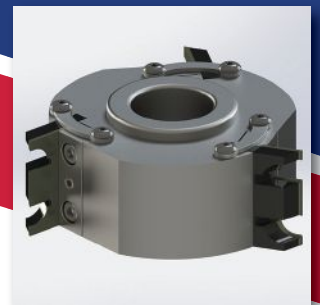
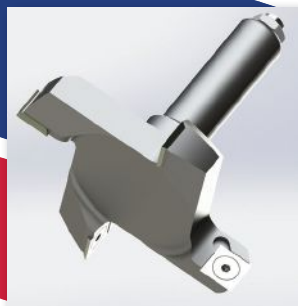
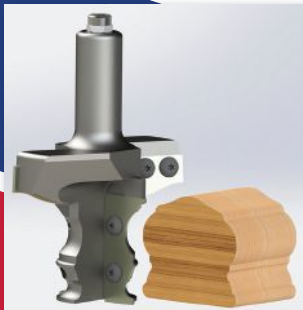
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The simple Filter Stand from Apollo Spray reduces spills and clean-up time, and filters coatings to prevent clogs in the gun.



This image from Fuji Spray shows the viscosity of a coating being measured by timing its passage through a measuring cup.



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plier doesn't have a data sheet, it can almost always be found online on the manufacturers' website.

MAINTENANCE AND MORE

It's important to clean the spray gun and all its parts and peripherals (nozzles, needles, etc.) after each session. But it's even more critical to inspect everything at the start of the next session in case something was overlooked. Caked old coatings can dissolve in the presence of new solvent, water or alcohol, and then contaminate a new finish. Residue that is released into a new liquid can also interrupt flow and clog the gun. Filtering a finish before loading it in the gun is a sound practice.

If possible, avoid letting polyurethane dry in a gun. Cured lacquer can usually be softened and removed, but the odds are slim for polyurethane.

How parts are handled as they travel through the spray booth can have a significant impact on the quality of a coat and the speed of the operation. Booth lines such as those from **Guffey Systems** (guffeysystems.com) and **Paintline** (paintline.com) can transform the finishing process. Both offer entry level through advanced options and cater to most budgets.

For small shops, **Total Finishing Supplies** (totalfinishingsupplies.com) in Vancouver, Wash., sells a drying rack called the Incredible Hulkrack 10, which expands as needed and can hold a maximum payload capacity of 1,500 lbs. And larger shops can add multiple HULK-X-panders to create a rack that can handle big jobs.



Infrared curing systems, such as the one shown here from Green Fast Cures, reduce contamination and speed up production.

So, what constitutes a spraying session? Recoating after a few minutes of drying obviously doesn't require fully cleaning the gun. Shellac and lacquer can be recoated quickly, and waterborne coats dry well in the right conditions (temperature and ambient humidity), but oil is slow.

It's common practice to wipe the tip clean between coatings, then wait until the end of the day to disassemble and clean. Some woodworkers pop a plastic sandwich bag over the nozzle if they are going to work again soon, but it depends on the carrier. With shellac-based primers such as Bin, it's a good idea to remove the air cap and soak it in lacquer thinner between coats, then



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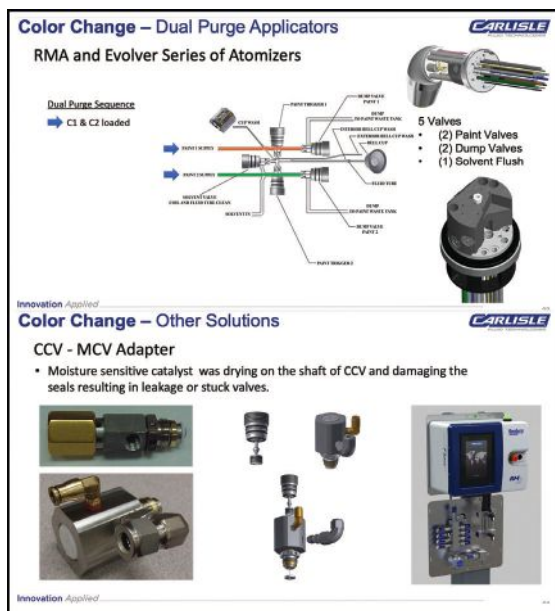
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Examples of two downloaded documents from a finishing seminar conducted by Carlisle Fluid Technologies.

wipe the nozzle clean. Some shops still use liquid ammonia as a cleaning agent for shellac and waterborne finishes, but it's highly toxic, and volatile. There are better options.

A PPS cup is a disposable cup that's used in the 3M PPS paint preparation system for mixing, measuring, filtering, spraying, and protecting paint. If a woodworker isn't

using a post-catalyzed finish and is in the middle of a two-day spraying job, it's a good idea to remove the PPS cup and put a plug in the cup outlet. Then remove the air cap, give it a cleaning, run some solvent through the gun, wipe the nozzle, fill the gun with solvent, and pop another plug into the inlet. This avoids any unintended curing. To begin the next session, just remove the solvent and get to work.

Low viscosity coatings can settle quickly, so the solids are no longer in suspension. Picking up a gun after a few minutes and giving it a swirly shake-up is tempting but doesn't really do much good. It's better practice to open the cup and stir the solids.

In most cases the faster a coating cures, the better. There are safe, explosion-proof dryers and heaters on the market that can speed the process to reduce runs and airborne dust contamination, but also to increase throughput. Solvent-based lacquer needs to be sprayed in an explosion proof booth, or it can be done outdoors if there's no breeze.

Sometimes it's not just the gun settings and the thinner that need to be adjusted. Results can also vary with the length and diameter of the hose and the location of the pump or tank. The manuals for the gun and pump should have guidelines on this. And sometimes a standard gun isn't the solution. A small airbrush can deliver pinpoint accuracy for small touch-ups, repairs and detailing, and is ideal for finishing small carved and turned work.

Aiming a spray gun sounds simple enough, but it isn't. New operators need to be shown how to keep the gun parallel to the surface, rather than swinging it in an arc.

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An airbrush, such as the Grex Tritium TS combo kit from the Lee Valley catalog, can be the perfect solution for spraying small jobs.

The pattern needs to overlap properly, and that can take practice. Raking lights illuminate runs and build-up better than direct light sources, and people new to the booth usually need to be shown the difference.

When it comes to best practices in the booth, safety is top of the list. PPE items such as masks, eye protection and gloves are essential, but they don't replace the need for proper ventilation. For small shops in those parts of the country where weather extremes require heating and cooling, the cost of providing make-up air can be daunting. An alternative energy source such as passive or active solar collection may be a viable alternative to relying on the power grid or natural gas.

One of the handiest spray booth accessories available is also one of the least expensive. **Grizzly Industrial** (*grizzly.com*) makes a spray gun holder (item H6142, \$2.07 in January 2025) that fits all gravity fed spray guns, can be mounted on a wall or a tabletop, and has a removable filter holder.

The first option for repairs to finishing equipment is to take it back to the dealer, but there are specialty shops, such as **NMR** (*nmrsspray.com*) in New Jersey, that repair equipment from all of the leading manufacturers of spray and liquid handling systems.

Carlisle Fluid Technologies is home to several leading brand names in this field, including Binks, DeVilbiss, BGK and Ransburg. The company's website, *carlislefluid.com*, offers educational PDF downloads on a number of topics. A few are product specific, but most are quite edifying and helpful for cabinetmakers and furniture builders who are, or want to, operate a spray booth. They're technical, and what you get by supplying your contact info is the slides from a seminar.

Autobody shops and larger custom wood shops may rent time in a spray booth, so that a small shop owner doesn't need to invest in buying, building or operating one. In that case, it will probably have plenty of heated or cooled make-up air, and adequate ventilation. Switching to UV wood coating can be safer than sticking with traditional solvent or even waterborne coatings. UV emits very low levels or no volatile organic compounds (VOCs).

It's also possible to avoid the spray booth. Most of the larger outsourcing suppliers will flat ship fully coated casework, doors and drawers directly to a jobsite, so the most exposure to finishes that a woodshop sees would be while touching up trim or doing a little repair work. **W**

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Enjoying the journey

Robert Burlacu answers the call at Royal Brand Woodworking

By Jennifer Hicks

Photos: Jennifer Hicks & Royal Brand Woodworking

Robert Burlacu, owner of Royal Brand Woodworking in Portland, Ore., has built up his business in the past 16 years with persistence and a focus on excellence and professionalism. The third-generation craftsman operates a one-man shop with occasional part-time help, specializing in kitchen and bath remodels, furniture, built-ins, storage solutions, and more. Through trial and error, he's learned that relentless self-motivation is the key to success.

"I think the number one thing is to just keep going, no matter what," says Burlacu. "Whether it's hard times, good times, whether it's the economy, whether it's something happening like Covid ... If you really like this industry, then don't stop. Everything happens for a reason, and you learn from it, but just keep going. You're going to realize in the long run that you were stressing for no reason, and you'll reflect and learn, and you'll grow that way."

Born in Romania, Burlacu, 43, emigrated to the United States with his parents in the early 1980's as they decided

to leave the country during its heightened state of communism. He grew up in the Portland area and learned many trades.

"My grandfather had a cabinet shop in Romania, and my father used to run a shop here in this building. So, growing up, I was around this industry, but I resisted it," he says. "I built homes, did tile work, worked on cars. I did everything else until I realized all I was doing was just wasting my time instead of doing something that's so natural to me."

"As soon as I finally matured enough and figured that out, everything just fell into place and skyrocketed."

In his early 20's, Burlacu worked for a cabinet shop and partnered with a cabinet design firm. "I started making cold calls for them to get business into their showroom. I'd get the permitting list from the county with people who were doing remodels or additions. At that time, I was just selling pre-made cabinets and doing other construction work around those projects."



Burlacu relies on word-of-mouth for most of his business, but the shop van helps too. Built-ins (right) are a popular offering.



THE BOLD MOVE

In 2008, Burlacu assumed his father's company, G & B Woodworking, at the start of the Great Recession. The timing was risky, but Burlacu found that jumping right in worked in his favor.

"In a way, I look back and it was almost perfect timing because things were going bad for a lot of companies," he says.

Not only did he avoid fierce competition as the newbie, but he also had access to incredible deals on used machinery and equipment.

"When I was younger, I always went to auctions with my uncles who did autobody work. So, I knew to go to auctions to buy tools to fill my big shop. Every week I would go and buy machines and tools for pennies on the dollar. I tried to be very specific on tools and quality, had to do a lot of research on what I needed. I would have never been able to afford all of that if it was a good economy."

His father's clients were mostly from the Romanian community, and Burlacu wanted to reach a broader demographic. He renamed the business and networked with contractors to develop client leads. "Things started flourishing by word-of-mouth and there's nothing better than that. I don't do any advertising," says Burlacu.

Clients are generally within an hour's drive. Most work is for residential remodeling projects and home additions.

"This shop is right between I-5 and I-205, which



makes it easy to serve Portland and Vancouver (Wash.) The Hollywood District is right next door. It has lots of high-end homes from the 1920s and 30s with old architectural styles. I do a lot of work there because I'm so close."

Burlacu also does some commercial work for restaurants, coffee shops and bakeries in the nearby Pearl District of downtown Portland.

"I've worked as far as three hours away, but most of the work is local, especially now with Google and Google reviews. People are looking for something that's close to them. Back in the day things were different but social media has changed that. People used to be worried someone was trying to scam them, but with reviews they can trust someone closer."

PLENTY OF WORK

Business has been good. Burlacu says that even during Covid, things ramped up because people were home with nowhere to go and decided to fix up their homes.

"I have never been slow in my business. Back in 2020 I had things on the calendar at least six months out. When I get to a point like that, I stop taking work because I don't double dip. I don't take more than one or two jobs at a time because that's where you can get into trouble. I have a really good rapport with my clients because they know when I say I'm going to do something, it gets done. They don't have to worry about it."

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Burlacu has had full-time employees but is content with working alone. He does have some part-time design help.

"He's a Navy veteran who loves woodworking. It's hard to find good help. A friend suggested I go to the V.A. office because there are so many people that want a job to subsidize their income, and so I did. He used to be a designer at Lowe's and Home Depot and does a lot of my design work for me now."

Burlacu enjoys offering finishing as part of his services and has a large spray booth in his 3,500-sq.-ft. shop.

"Typically, all doors and drawers are finished here in the booth, but I paint on site so I can have a seamless paintjob where everything gets caulked in, where it looks like it was built into the home with no joints, seams or cracks."

FUTURE PLANS

Burlacu says he wants to start planning his retirement in about five years, and with that in mind, has no intention to grow the company.

"Nothing's going to change significantly in the next five years, but after five years I want to start transitioning into downscaling. I want to fully rent out the buildings and just do more handiwork. I don't want to sell the company. If my kids want to run it or something they can, but I want to just downsize, specifically."

With three children under the age of 10, he says he wants to spend more time with his family.

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"I just don't want to have so much going on with this that I'm not enjoying life. If I have to continue that's fine, but I don't need to grow more and I don't want to grow more. I'm very comfortable where I'm at. I'm happy and don't consider this work at all. This is fun. Even though I work physically, I enjoy it. If I didn't enjoy it, I wouldn't do it."

Burlacu has gained considerable experience and confidence since his humble beginnings in 2008 and is glad he embraced a career in cabinetry using his innate talents.

"Working in this environment is natural to me. If I was in an office, I would just not be happy. For me mainly, and it took a long time to figure this out, I love to solve problems and accomplish things. It's not so much the end result that I care about, it's the journey it takes to get there. Once it's done, I move on to the next problem, next situation, next client."

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The key elements that help shops make the best cabinets and furniture are functional and decorative hardware, CNC capabilities, and an outsourcing partner that can handle orders quickly and expertly.

Blum has developed its top-hinged door hardware and state-of-the-art drawer systems to give custom shops some distinct advantages in terms of style and function. AVENTOS Top, a premier system that allows doors to move up and away, has just become even easier to install when a woodworker uses the supplied positioning template and advanced adjustment mechanics. And the company's MERIVOBX drawers are part of a component-based system that is "quick to build and built to last".

From CNC routers with auto loading to high-speed edge banders with up to nine stations, or automated boring machines and saws with onboard optimization, Michigan-based NewCNC takes a woodshop's production to the next level. This is a company that believes craftsmanship should be enhanced and not hindered by its blend of superior technology and customer support.

With vast experience and a new world-class production facility, Elias Woodwork offers anything a custom shop customer needs, including the Elite Cabinetry flat-packed casework line and a complete complement of door choices. Among the latest is the Groovy door, which alone is worth a visit to the website. Elias also supplies everything from moldings to sheet stock, drawer boxes, hardware and more – in fact, just about anything a woodshop needs to make the best cabinets and furniture.



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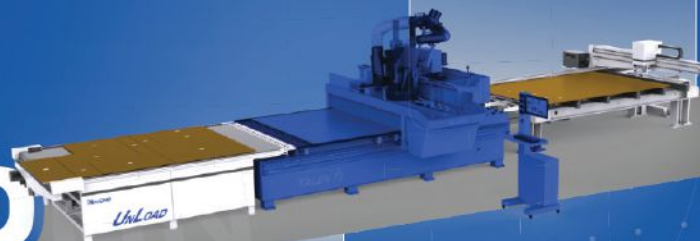
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Small Shop, Big Advantage

How NewCNC Helped Bravo Automate Their Production

Miami, Fla. is known for vibrant Art Deco architecture, pristine beaches, and a thriving industry in interior design manufacturing. Amidst this creative hub, a small woodworking shop quietly experienced a revolution. Jorge Cruz, a marine veteran who owns and operates Bravo Closets & Cabinetry, a specialist in custom closets, kitchens, and built-ins, was about to embark on a journey that would transform its operations and redefine its potential.

For 30 years, Bravo had relied on traditional woodworking methods, operating with a small but dedicated team. The shop's craftsmanship was impeccable, but its production capacity was limited and, more often than not, outsourcing created bottlenecks in projects. This hindered their ability to take on larger jobs and meet growing demands.

"We were at a crossroads," Jorge Cruz said. "Our passion for quality was unwavering, but we were constrained by manual processes and held at the mercy of the job shop's timeline. We knew we needed to find a better way."

After discussing the problem with industry peers, Cruz was encouraged to explore a partnership with New CNC, a leading provider of advanced woodworking machinery. He scheduled a demo at the company's headquarters in Holland, Mich. and the visit

proved to be a revelation. It was obvious that New CNC was absolutely dedicated to empowering woodworkers and supporting their customers.

The centerpiece of Bravo's new direction is a Talent T5D CNC router, which is a versatile and powerful machine that immediately streamlined Bravo's routing and drilling processes. With its precision and speed, it eliminates time consuming manual tasks, and uses an automated lift table and unload conveyor system (AL – UL) to eliminate the strenuous and slow process of handling heavy panels.

CNC also provided the final piece of the puzzle – a Fuse 8M Edgebander that is strategically placed at the end of the unload conveyor. This creates a closed-loop system, optimizing material flow while minimizing manual intervention.

"Our production skyrocketed," Cruz reports. "Our quality improved, and we've been able to expand our business in ways that we never thought were possible. We're not just keeping pace with demand, but we're exceeding it and taking on more ambitious projects. Bottom line, we're now confidently meeting the needs of our clientele."

The impact of automation was immediate and dramatic. Bravo increased their production capacity fourfold, enabling them to

take on a wider range of projects, expand their offerings, and meet customer demands with unprecedented efficiency. This surge in productivity wasn't just about numbers, it fueled a remarkable 50% revenue increase, solidifying Bravo's position as a leader in the competitive design industry.

The time savings were also a game



changer for Jorge and his team. They marvel at how automation has transformed their workflow, compressing 15-hour jobs into 2-hour timeframes and giving them back valuable time to focus on what they love most. The benefits of automation extend beyond increased output. The precision of the CNC machines ensures consistent quality across all components, minimizing errors and reducing waste. This not only enhances the craftsmanship of their products, but also improves their bottom line.

With New CNC's automation solutions, Bravo Closets & Cabinetry has undergone a complete metamorphosis. They have evolved from a small, labor-intensive operation into a highly efficient and productive manufacturing powerhouse, capable of scaling their business while maintaining their unwavering commitment to quality.



NewCNC

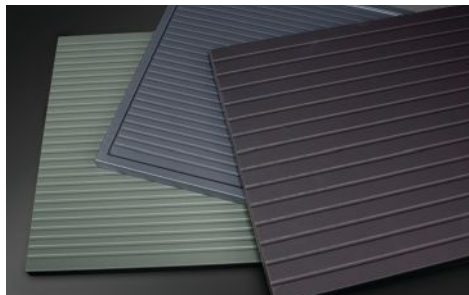


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Get the Competitive Edge with Elias Woodwork

Just over a year ago, a cabinetmaker's tablet became a better tool than a table saw for making fine casework. That's because at the end of 2023 Elias Woodwork opened its new state-of-the-art North American facility to build AOS (assemble-on-site) custom cabinet boxes. The company has been building superior cabinetry for custom shops since 1983, and its vast experience has now been combined with the industry's most advanced machines and technology in the new 50,000 square foot AOS facility.



AOS Elite Cabinetry flat-pack casework is available in either white or classic maple furniture board, or a UV finished birch plywood. The parts can be edge-banded in white or various matching wood grains, and the boxes can be assembled on the jobsite or in the woodshop using either preinstalled Lockdowel hardware that requires only a rubber mallet and glue (no screws) for assembly, or a screw and dowel process.

And to further simplify everything from bidding to assembly, the cabinet boxes can be quoted and supplied with all the door hinges and drawer slides.

Celebrating over forty years of being one of the most reliable and innovative suppliers of cabinet doors and drawers, Elias Woodwork shares the advantage of its geographical loca-



tion at the epicenter of North America with woodshops across the entire continent. In addition to solid wood and rigid thermofoil (RTF) one and five piece doors and fronts, the company offers a comprehensive catalog of components to professional woodshops that includes material options such as TFL laminate slabs, and paintable HDF doors. Among the newest offerings is the Groovy RTF door, which is a vertically fluted grooved door that can add a classical influence to modern, transitional or minimalist designs. These new door styles come with a 12 year warranty along with all RTF product from Elias Woodwork.

Elias Woodwork also supplies a huge array of accessories and sheet goods, plus drawer boxes in a wide range of species and finishes, and in both dovetailed and doweled options. The company offers a 12-year warranty on its RTF products, which is unique in the industry and a strong selling point for woodshops.

The bottom line is that Elias's 470+ employees, four decades of experience, and 400,000 square feet of production space can help woodshops make the best furniture and cabinets.

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Simple Solutions for Elegant Design: AVENTOS top and MERIVOBX



When it comes to cabinet hardware, simplicity is key to both function and installation. AVENTOS top lift door systems and MERIVOBX drawer systems from North Carolina based Blum Inc. both offer homeowners cutting-edge design and functionality while streamlining the ordering, assembly and installation process for cabinetmakers.

AVENTOS top delivers both stylish design and maximum functionality. The doors move up and out of the way to give homeowners unobstructed access to cabinet interiors. And AVENTOS top is now easier than ever to install. An integrated positioning template removes any guesswork, and it ensures accurate placement of the mechanism with no complicated measuring required. Adjustments are straightforward,

with clearly marked points that deliver perfect reveals. The system's versatility supports a range of applications and cabinet widths up to 72", making it an ideal solution for rooms throughout the home.

The MERIVOBX drawer system is quick to build, and built to last. Combining durability and versatility, MERIVOBX offers a sleek, modern look for traditional cabinetry. Its innovative platform design enables multiple looks using just a few components – and all with the same straightforward process. This standardization reduces complexity and makes MERIVOBX an ideal starting point for Blum's box systems.

MERIVOBX has a platform design that simplifies the transition between configurations. So, whether a cabinetmaker is working with a top drawer, deep drawer with a design element, BOXCAP or a gallery rail, unique designs can be achieved without the need to master new techniques. And each configuration adds a touch of visual interest, elevating the overall design.

MERIVOBX can support up to 170 lbs., and accommodate widths of up to 55". For added functionality or a seamless, handle



free look, a shop can pair MERIVOBX with touch-to-open technology.

Both AVENTOS top and MERIVOBX prove that simplicity doesn't compromise innovation. These thoughtfully designed solutions elevate the experience for everyone involved, seamlessly bringing beauty and ease together.



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The Legacy Rogue, a fully-enclosed, 5-axis CNC for production turning.

Beyond bulk and mass

While size matters, speed, rigidity and automation options are factors in the larger CNC market

By John English

The custom nature of woodworking means that choosing the right CNC router can be quite a subjective process. Shop requirements differ in aspects such as door profiles, sheet stock cores and faces, solid wood species and cuts, hardware milling, edge and panel profiles, and most of all design preferences. So, shopping lists for a CNC can have different priorities.

CAPACITY AND RIGIDITY

The size of the worktable is the most obvious prerequisite, and perhaps the most important. For cabinetmakers the main focus here is on 2D dimensional capacities in the X and Y planes, as the machine is primarily used for machining flat panels. And while the entry-level standard is a bed that can accommodate nominal 4' x 8' (49" x 97") sheets, other size sheet goods such as 4' x 10', 5' x 10' or 5' x 12' are also available. If a shop is large enough to handle, store and machine those, then the manager may want to consider the relative economics of working with them before committing to a CNC bed size. It's not just about the square foot pricing of sheet goods. There are other considerations such as the ability to store and manipulate overly large sheets, or the opportunity to make a single part that exceeds 97" in length. Visually, larger sheets offer the possibility of fewer seams and grain matching challenges. Mechanically, they offer fewer joints or small parts

to cut. Plus, some sheet goods come in 5' x 5' sizes, so a wider bed can eliminate the need for pre-sawing. There is also the possibility of two beds with one or two spindles, so physical capacity isn't limited to choosing a single larger table.

Rigidity is probably the next most important consideration. If there's any give or vibration during machining, accuracy suffers. In a high-volume production environment, errors can become cumulative if a nesting solution is working off an established but inaccurate edge. So, beyond sheer bulk and mass, motion is at the top of the list here. There are some choices for the drive system that allows the gantry and spindle to move in X and Y. Small shop machines often use options such as belts or lead screws, but CNCs for larger shops are going to offer either high-precision ball screws or precision helical rack-and-pinion drives. (A lead screw is just a threaded block of metal with a screw rod running through it.)

High-precision ball screws add ball bearings to the mix, along with a pathway for the bearings to follow. The family of ball screws used in CNCs are made with premium materials and are very accurately ground, so they deliver movement that exceeds the smoothness available with standard ball screws. The result is consistent movement across the entire cutting area.

According to Joe Voytush and the engineering team

at ball screw manufacturer **Barnes Industries** (barnes-ballscrew.com) in Madison Heights, Mich., ball screws are "mechanical devices that convert rotary motion into linear motion", and both CNC and robot manufacturers like them for their accuracy, efficiency, and low friction. The main element in a ball screw is a round spindle or shaft with a groove cut along the outside. As the shaft turns, the housing (gantry) moves along the shaft in either direction. The groove is a helical (angled screw thread shaped) raceway for the ball bearings that allows the shaft and housing to glide past each other. The bearings keep the two parts at a uniformly separated distance, and as the helical 'screw' rotates it lets the housing travel back and forth along the length of the shaft. Going back to the Barnes definition, as the shaft turns (rotary motion), it moves the housing (linear motion). The result of using ball bearings is smoother and more accurate movement with reduced friction and lower motor torque requirements.

Another X and Y drive system, the helical rack-and-pinion, can be found on machines such as the Atlas, Titan or HDS series from **Techno CNC Systems** (technocnc.com). According to Techno, "helical racks are mounted directly on the precision machined steel frame, resting on a machined ledge, and therefore, do not vibrate."

As with the ball screw, a helical rack-and-pinion also converts rotary motion to linear movement. But the rack here is a long, flat gear with angled 'female' teeth and the pinion is a round wheel with angled 'male' teeth. When these teeth mesh against each other, slippage along the angle causes movement. As the rack is secured to the machine body and therefore unmoving, whatever is attached to the pinion (in this case a CNC gantry or spindle) will move if it's allowed to. Techno also uses a direct drive system going from the X and Y axis motors to the pinion, which eliminates the need for a belt and pulley that can be susceptible to play. And for precision, the linear rails and helical rack-and-pinion are laser aligned.

Both ball screw and helical rack-and-pinion systems have their advocates, and rightly so as this is top-level engineering. So, it behooves a shop owner to listen to the detailed arguments for and against each system on a machine-by-machine basis.

Longevity for both systems relies on superior dust control, and build-up from resins, sap and adhesives can negatively affect either one. So, extraction becomes part of the decision about buying a CNC for a growing shop.

GETTING UP TO SPEED

Speed can be critical in several ways for a shop that's looking at a larger CNC. First off, there's the gantry motion that moves the spindle and the tooling across the part in X and Y. For a production shop, that's a concern because it translates directly into doors per day. A typical benchtop partial-sheet CNC in a one-man shop will move at a traverse velocity (X and Y speed) in the neighborhood of 90 inches per minute. A large shop alternative such as the Spectrum CNC from **Anderson America** (andersonamerica.com) can move at up to 3,350 inches per minute, which is about 37 times as fast. Travel time can vary dramatically in larger machines, and while traverse speed is more important for larger shops, the answer will probably be neither a Porsche nor a Pinto. The need for speed will depend on how automated



The PRS5 Alpha ATC from ShopBot, available with a 5' x 12' table and an optional fourth axis.



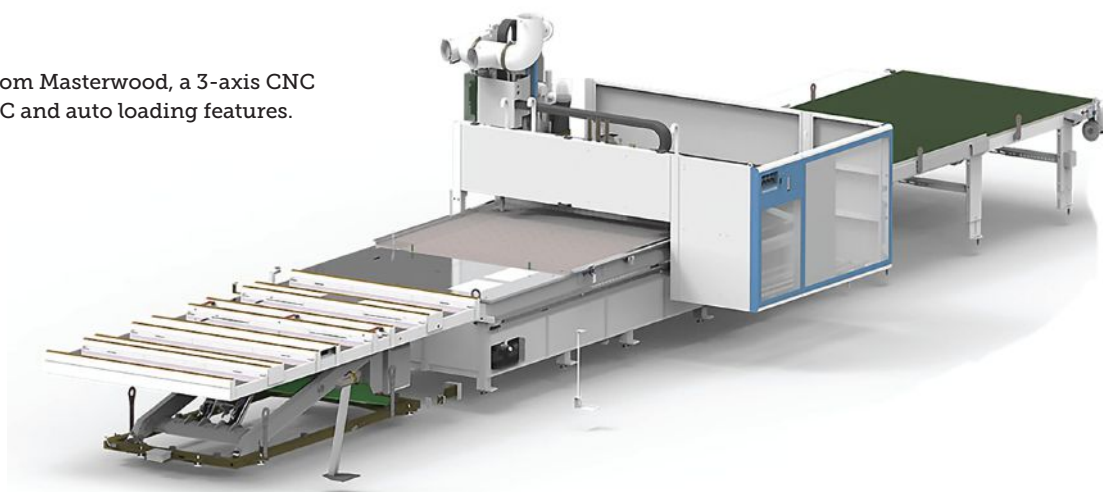
The Pegasus, from Limtech Industries, can be fitted with a 10' x 40' table and eight spindles.



The Spectre, featuring Fanuc controls, 16-hp spindle, and automatic tool changer, from Phantom.



The Talent T5SK from NewCNC, available with a 12-tool ATC and automatic alignment, load and unload.



The Nesting M from Masterwood, a 3-axis CNC with labeling, ATC and auto loading features.



The Format4 profit H350R is one of several new option-heavy machining centers from the Felder Group.



The SmartShop 5 Axis (top) and 2 Auto Loader from Laguna Tools.



Thermwood's MultiPurpose 67 with two 5' x 12' tables.

the production line is, and how many employees tend the machine. There's no sense paying for performance that creates a bottleneck before the CNC because it's too slow, or after because it's too fast. Knowing the shop's manageable throughput and optimum cutting rate will eliminate many machines and help focus the search for a new CNC.

Next up there's the element of speed when it comes to incremental cutting power. If the spindle isn't powerful enough, each cut needs to be made in more passes. And the more passes required, the longer it takes to make each part. Of course, tooling has a lot to do with this. The tool's size and sharpness both affect its cutting speed, and so does its geometry. But the quality of the tool is irrelevant if the spindle can't turn it smoothly and at an optimum rate. While a benchtop CNC might be running a 3-hp router, and an entry-level floor model CNC spindle might be rated between 4 and 12 hp, large-shop machines usually offer a choice. For example, Anderson's Exxact can be ordered with 18- or 24-hp. And that brawniness is typical: **CAMaster's** Edge series (camaster.com) has a 16-hp spindle, and the Teton 5 from **DMS** (dmscncrouters.com) comes with a 17.43-hp spindle.

High-volume machines rely heavily on ATC, and while the limited nature of linear automatic tool changers on smaller machines can slow things down, that's usually not a problem in larger machines that use a carousel. It is, however, worth asking about, especially if the shop's processes involve a lot of tools.

The other critical concern that involves speed is material handling. Automation options increase exponentially as machines get bigger. CNCs for larger shops offer placement and stop systems, robotic sheet loading and parts unloading, identity systems such as labels and stamps that expedite sorting and stacking, and large enough pumps to power the vacuums during loading and positioning.

Pendulum processing has come to the fore of late, and it's an option that high-volume shops need to explore. It gets its name from the fact that the tooling swings back and forth over the work like a clock pendulum so that there is constant machining without stops between loading and unloading. The CNC cuts more than one part at

the same time, which can reduce downtime. It uses more bed, so it works better on larger machines.

It's surprising, but although the spindle is obviously critical, it's not quite as important in the buying process as some of the other considerations above. That's because spindles can be changed out or upgraded a lot easier and less expensively than a wobbly bridge or a too-small work area. As mentioned, a more powerful motor allows for faster material removal. It also delivers more efficient milling of thick or large parts, especially in a 5-axis application or when running aggregates.

WHAT'S AVAILABLE?

Technology continues to evolve at a blazing rate, especially in the areas of artificial intelligence and programming. So, there's a lot to look at when it comes to CNCs for larger shops.

The new Jet Master RT/C from **Casadei-Busellato America** (casadeibusellato.com) comes in 3-, 4- and 5-axis versions with parts unloading. The X-Y capacity is 52" x 122", with options available up to 74" wide. There's 7" of standard Z travel with an option that's almost 10". The 3- and 4-axis spindle delivers 12.4-hp with an optional 20-hp upgrade, and the 5-axis comes with 13.4-hp and an 18-hp option. **JKL Machinery** (jklmachinery.us) in Brighton, Mich., is the official North American importer for Casadei-Busellato.

Table sizes are usually customizable on larger machines, which can help a shop when it machines large or wide objects or sheet goods, or has an unusually shaped or sized floorspace available. But most manufacturers offer enough choices to meet the shop's needs. For example, **Thermwood** (thermwood.com) makes its 5-axis MultiPurpose line in single table versions of 5' x 5', 5' x 10', 10' x 5', 5' x 12', and 7' x 10', and in dual table set-ups using the 5' x 5', 5' x 10' and 5' x 12' formats.

The Felder Group (felder-group.com) has added six new machines to its Format4 Profit line of CNC centers, complementing the existing H08 and H80I nesting models. Among the new machines are the H500R 5-axis where the drilling head covers the whole field and there's room for pods up to 100mm tall; the H100 with Smart Zoning



The new Jet Master RTC from Casadei-Busellato, available in 3-, 4- or 5-axis versions and with parts unloading.



The Teton5 from DMS is a 5-axis machine with a 17.5-hp spindle and pendulum processing.



The Edge Series CNC from CAMaster, available with a 16-hp spindle and five table sizes up to 6' x 12'.



The 4-axis Universal CNC from Castaly Industries, available with twin tables and two six-zone vacuums.

and pendulum loading; the H150 with 5 axes and pendulum loading plus 200mm of Z loading room; the H200R that has a small footprint but big muscle; the H300R that also saves space and has a large Y dimension; and the H350R that has a 5-axis, 16-hp (12 kW) liquid-cooled motor, full coverage drilling, dual circuit clamping and again the large Y for maximum processing depth.

While **Laguna Tools** (lagunatools.com) also offers custom-built CNCs, the company builds a wide range of standard machines and the SmartShop 5-Axis and 2 Auto Loader setups are among those designed for production work. The 5-Axis has a 9-hp spindle, a 12-position rotary tool changer, great access, pop-up pins and a pod ready table. The 2 Auto Loader includes clean sweep technology and a 12-hp HSD spindle, along with an eight-position rotary tool changer.

Pro Edge Technology (proedgetechnology.com) in El-lenton, Fla., carries Anderson CNC routers but also makes special purpose joinery machines such as a CNC edge and dowel machine and special units for Lockdowel and OVVO connectors. The Elev8 is the only machine in the industry with both horizontal and vertical routing capabilities on a bore and dowel machine. It uses three electro-spindles coupled with a 3-axis CNC control to not only bore simple holes but also perform special machining on a panel for hardware such as Rafx, Minifix, Maxifix, Confirmat, and Domino slots. It can machine the rear panel notch for undermount drawer slides, mill for Soss hinges, and create dadoes and blind dadoes that are programmed to automatically change size and length as the panel sizes changes.

Masterwood (masterwood.com) makes a full range of CNCs for larger shops including several nesting models, among which are the M and the M5. The Nesting M is a 3-axis machine, while the Nesting 5 is a 5-axis CNC. The M is billed as a complete nesting cell and it includes automatic labeling, loading and unloading, and a carousel tool changer.

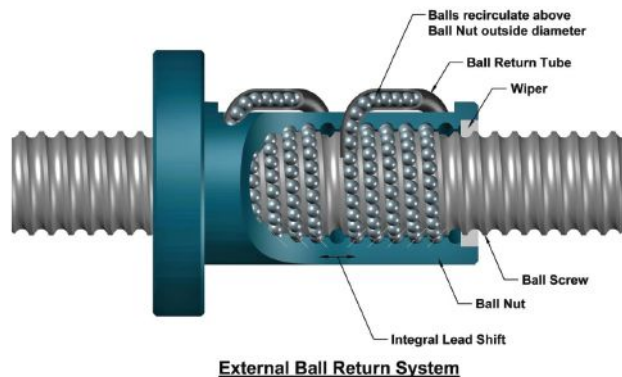
The Talent T5SK from **NewCNC** (newcnc.com) is a high-performance, three axis, panel-processor with 1.5 KW servo motors, a 16-hp spindle, and Delta CNC controls. Rapid speeds of 100 meters/min. (3,937 inches per minute), a 12-position ride along ATC, automatic panel alignment, and pre-configured auto load and unload are all standard.

The largest machine from **Phantom CNC Systems** (phantomcncsystems.com) in Vanceboro, N.C., is the Spectre which features a Fanuc Oi-MF control system, a 16.1-hp VFD air-cooled spindle, an automatic tool changer (eight linear and 12 rotary), and a multi-zone vacuum table with T-slot clamping and zone control for rock-solid substrate stability.

TABLE TALK

Limtech Industries (limtechindustries.com) says that its Pegasus series is "for customers looking for the ultimate big boy's machine." Designed with heavier duty gantry and frame than anything else that the company builds, it also has a Fanuc controller and three linear guide bearings for every guide rail. With its super strong structure, the Z stroke can be up to 40", the table can be up to 10' wide by 40' long, and the Pegasus can be set up with as many as eight spindles.

Castaly Industries (castaly-cncmachine.com) offers several high production models including the Universal which is a 4-axis machine that can be ordered in 4' x 8' or 5' x 10' versions with the optional rotary head. There's also a Twin



A ball screw from Barnes Industries that converts shaft rotation into linear movement of the housing.

Table CNC that has two six-zone vacuum worktables that allow alternate processing along with automatic switching and automatic feeding.

The table of the PRS5 Alpha ATC from **ShopBot Tools** (shopbottools.com) is a streamlined design where the sides and rails are level with the tool bed, so materials can be loaded and unloaded easily. The machine comes with a choice of 8", 14" or 26" of Z travel, and tables are sized from 48" to 192". ShopBot also offers an optional Rotary Indexer that cuts three-dimensional objects on the PRS5. Like a lathe, it provides a fourth rotary axis and also deliv-

ers precise indexing.

A fourth axis has always been part of the **Legacy Woodworking Machinery** (legacywoodworking.com) lathe experience, and the company says its Rogue series "are the ultimate 5-axis turning CNCs available. The system boasts three axes for the spindle and an additional two axes for the turning center. The fourth axis (A-axis) rotates the part, and the fifth axis (B-axis) sets the bed on an angle for quickly turning parts and adding details on a tapered section." The machine is fully housed and enclosed for noise and dust control, and offers larger woodshops a complete answer for the manufacture of stair, decorative and other turned parts.

SCM Group North America (scmgroup.com) offers more than 30 CNC machining centers for larger shops, including such brands as Accord, Morbidelli, Ergon, Hypsos, OMAL, Balestrini, and Routech. Because of the scope of its machinery catalog, the company can also help a shop integrate a CNC into various cells and lines.

Larger woodshops searching for a new CNC might also wish to visit the websites of highly reputable manufacturers such as **AXYZ** (axyz.com); **Biesse** (biesse.com); **C. R. Onsrud** (cronsrud.com); **Holz-Her U.S.** (holzherusa.com); **Stiles Machinery** (stilesmachinery.com); **OMGA** (omgainc.com); **John G. Weber Co.** (used.johnwebber.com); and **Hendrick Manufacturing** (hendrickmanufacturing.com). **W**



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Fine Furnishings approaches milestone

By Jennifer Hicks

The Fine Furnishings Show in Providence turns 30 this fall. Scheduled for Nov. 7-9 at the WaterFire Arts Center, the event has supported makers of furniture, accessories, and home decor since opening in 1996 at the Rhode Island Convention Center.

"In the beginning, the show was built with the involvement of several state organizations that helped and supported artists and craftsmen. There were state pavilions of exhibitors from Maine, Vermont and New Hampshire, along with artists and craftsmen from other New England states and beyond. The state organizations remained for about the first five years," says Karla Little, the show's founder.

"The show moved to the Pawtucket Armory about 13 years ago when looking for a more intimate and archi-



tecturally interesting building to house the show. While many of the exhibitors of the early days have retired it is encouraging the show now includes new, young, and up and coming artists and craftsmen, many who are alumni of the North Bennet Street School which brings students and their work to the show each year.

"More recently the show has been held at the spectacular WaterFire Arts Center for the last seven years. It is an exhibitor and attendee dream venue being on ground level

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Best Traditional (left)
by Mike Johnson and
Best of Show by David
Lane at last years'
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Winning work by Luke Orth (top) and Charles Finne at last year's Northern Woods.



Other 2024 winners included Richard Helgeson (chair), Don Wattenhofer (turning), and Karl Heal (bench).



with state-of-the-art systems, many load in/out doors, a retail store and gallery, spotless restrooms, parking for over 500 cars surrounding the building, and a fabulous staff."

Learn more at finefurnishingshows.com.

NORTHERN WOODS TURNS 41

The Minnesota Woodworkers Guild has scheduled its 41st annual Northern Woods Exhibition for Apr. 24-27 at the Eden

Prairie Center in Eden Prairie, Minn. The fine woodworking exhibition features work by members and non-members of all ages and skill levels.

This year's competition offers 16 prizes in 13 categories, including Best First Time in Show, People's Choice, and Best Youth Piece awards. The show also features a Meet the Makers marketing opportunity.

Learn more at mnwwg.org. [W](#)

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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 at least 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

ARIZONA

April 29-May 1 — Woodworking Industry Conference, presented by the Wood Industry Association, featuring networking opportunities, presentations and more. Location: Fairmont Scottsdale Princess in Scottsdale. woodindustry.org

June 2-25 — Fundamentals of Traditional Woodworking I. Intro to wood technology, hand tool usage, design principles and creation of joinery. Fee: \$765. Location: Southwest School of Woodworking in Phoenix. sw-sw.org

June 30-July 24 — Fundamentals of

Traditional Woodworking II. Building on skills taught in Fundamentals I, this class introduces power tools and concludes with a bench with mortise and tenon joinery and draw bore joints.

Fee: \$832. Location: Southwest School of Woodworking in Phoenix. sw-sw.org

July 28-Sept. 4 — Fundamentals of Traditional Woodworking III. Students will practice various joinery and construction techniques to build a Shaker-inspired table with dovetailed drawer, tapered legs, and mortise-and-tenon aprons. Location: Southwest School of Woodworking in Phoenix. sw-sw.org

CALIFORNIA

Monthly — San Fernando Valley Woodworkers meetings are held on the third Thursday of each month at 7 p.m. at the Highland Hall Waldorf School's woodshop in Northridge. sfvw.org

Monthly — Society of Wood Manufacturing, a chapter of AWFS consisting of educators, manufacturers, hardware and industrial suppliers, and machinery dealers, meets during the second week of each month. For location and dates, visit awfs.org.

Monthly — San Joaquin Fine Woodworkers Association meetings are open to all experience levels at members' shops. For locations and dates, visit sjfwa.com.

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



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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. tampawoodcrafters.org

April 10-12 — Stairbuilders & Manufacturers Association's annual conference featuring educational presentations, networking, awards, and more. Location: Hilton Pensacola Beach, Pensacola. Register and learn more at stairways.org.

GERMANY

May 26-30 — LIGNA, an international trade fair for woodworking and wood processing machinery and tools. Location: Hannover. ligna.de

MAINE

Ongoing — The Center for Furniture Craftsmanship offers year-round classes in woodworking to the highest degree of craftsmanship. One- and two-week workshops from June through October; 12-week Furniture Intensives; a nine-month Comprehensive; eight-week Turning Intensives, and Fellowships. woodschool.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. Contact: Manny Flecker at aaron0641@hotmail.com.

MASSACHUSETTS

May 24-26 — Paradise City Arts Festival. Memorial Day weekend show featuring handcrafted work from 200 curated artists, demonstrations, workshops and more. Location: Three County Fairgrounds in Northampton. paradisecityarts.com

MINNESOTA

Monthly — The Minnesota Woodworkers Guild meets on the second Tuesday of each month at various locations. mnwwg.org

April 24-27 — Northern Woods Exhibition, hosted by the Minnesota Woodworkers Guild. Open to amateurs, students and professionals. Location: Eden Prairie Center in Eden Prairie. Learn more at mnwwg.org.

June 28-29 — American Craft Fest, hosted by the American Craft Council. Location: Union Depot in St. Paul. For more information, visit craftcouncil.org.

NEVADA

July 22-25 — AWFS Fair, featuring over 500 exhibitors, educational seminars, networking opportunities, and more. Location: Las Vegas Convention Center. awfsfair.org

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NEW JERSEY

Monthly — The North Jersey Woodworkers Association meets the third Monday of every month. njwawoodworkers.org

Monthly — The Professional Woodworkers Guild of Upper New Jersey meets the third Wednesday of every month. njwoodguild.com

NEW YORK

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

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

April 26 — Getting the Most from your Band Saw with Michael Fortune, a one-day workshop. Fee: \$200. Location: Wendell Castle Workshop in Scottsville. wendellcastle.org

April 28 — May 4 — Advanced Woodworking: Tables and Benches with Michael Fortune. Fee: \$1,400. Location: Wendell Castle Workshop in Scottsville. wendellcastle.org

May 18-20 — International Contemporary Furniture Fair at the Javits Convention Center. icff.com

May 26-30 — Northeastern Woodworkers Association Woodworkers Showcase, featuring work by amateur and professional woodworkers. Location: Saratoga Springs City Center in Saratoga. woodworker.org

June 26-28 — Furniture Society Conference, "You Are Here: Makers, Place, & Impact", featuring workshops, artist talks, panel discussions, demos, and more. Location: Syracuse University. furnsoc.org

NORTH CAROLINA

April 15-17 — National Wood Flooring Association's Expo, a trade show dedicated exclusively to wood flooring. Location: Charlotte Convention Center. nwfaexpo.org

April 26-30 — Spring High Point Furniture Market. The furniture industry trade show features showroom tours, vendors, speakers, educational seminars, and networking events. highpointmarket.org

TEXAS

Sept. 13-14 — Texas Woodworking Festival, an annual event featuring demonstrations, classes and lectures. Location: Palmer Events Center in Austin. texaswoodworkingfestival.com **W**

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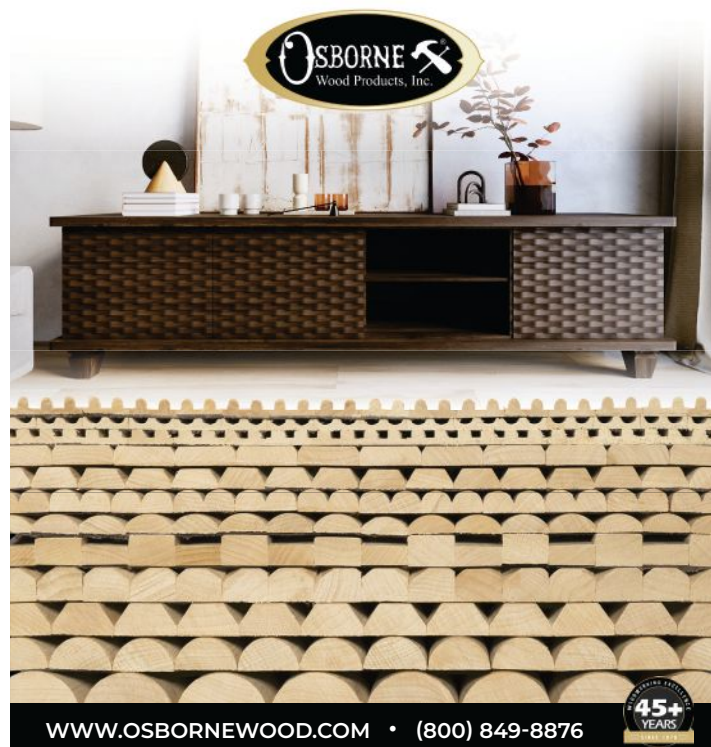
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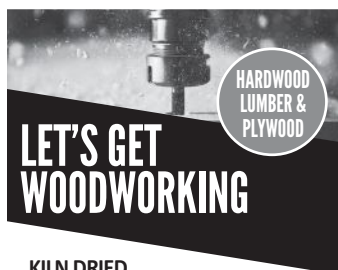
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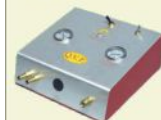


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Annalisa Barron



Christian Wargo

Trailblazers

The Wendell Castle Workshop (WCW), a woodworking and furniture design school in Scottsville, N.Y., has selected Annalisa Barron and Christian Wargo for its inaugural artists-in-residence program.

Barron began her residency in February as the instructor of two metalworking classes. Wargo completed a five-week residency in February.

"We are now entering year number two of the WCW and have many exciting things going on including welcoming our new inaugural artists-in-residence," says Ken Page, the school's director.

Barron is an interdisciplinary artist based in New York City and Rochester, N.Y. She graduated from Penn State University with a BFA in Painting and Drawing and has an MFA in Sculpture from the Pratt Institute. Her work has been exhibited at the Cooper Union, University of Rochester, Southern Oregon University, BunkerProjects Gallery, U.S. Embassy in Nicaragua, No/Gloss Film Festival, and Anthology Film Archives. She currently teaches at the Rochester Institute of Technology's College of Art and Design.

Wargo is an artist and musician based on the West Coast. A member of the band Fleet Foxes, he has toured the world performing as a bass player and vocalist. Born in New Jersey to an art teacher mother and a carpenter father, he took an interest in creative endeavors and attended a vocational high school where he studied art, drafting, and woodworking. He became further interested in woodworking after visiting the Wharton

Esherick Museum, where he discovered the potential of fine art principles applied to functional objects. Throughout his career, Wargo has balanced his musical endeavors with various artistic pursuits, including building furniture, painting and drawing, the school said.

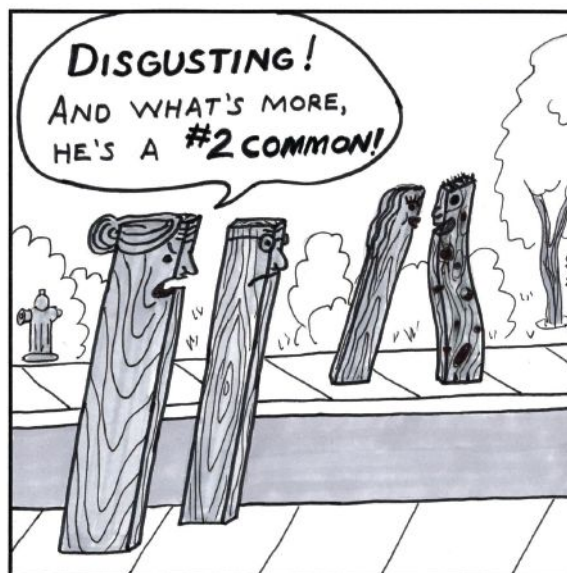
"Having just completed a three-year tour cycle in support of the band Fleet Foxes' latest album, Wargo plans to use his downtime as a resident artist at the WCW to explore more innovative design possibilities and further develop his craft," says Page.

"The WCW strives to provide artists the opportunity to experience the creative processes at its campus promoting experimentation and exploration. In this respect, the artists-in-residence program advances our mission as a creative hub where people come from around the globe to learn, create, and connect."

Learn more at wendellcastle.org. **W**

60 Grit

Rough humor by Steve Spiro



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