

Learning Objectives

Interiors & Sources' Continuing Education Series articles allow design practitioners to earn continuing education unit credits through the pages of the magazine. Use the following learning objectives to focus your study while reading this issue's article. To receive one hour of continuing education credit (0.1 CEU) as approved by IDCEC, read the article and go to interiorsandsources.com/home/ceus.aspx and follow the instructions.

After reading this article, you should be able to:

- Explain the sources of inspiration for new decorative surface designs
- Describe the basic steps taken in a new design launch
- Discuss the décor printing process
- Explain why materials like TFL are better than carbon neutral



Visiting the lumber broker, looking for inspiration.

WHERE DOES DESIGN COME FROM?

A behind-the-scenes glimpse at the creation of best-selling decorative surface designs.

When you look at a decorative laminate panel with a woodgrain design, do you ever wonder: "Is this a literal reproduction of a piece of solid wood? Or was it designed in a lab to look like solid wood?" The answer? Yes.

What you see on that conference table, headboard or wall panel might just be the end product of a process that began in Milan, Cologne, New York, or rural Pennsylvania, and finished in a design studio in Germany, Japan, or the U.S.

Decorative surface introductions aren't conjured in a vacuum. They're created by designers who constantly scour the globe's design exhibitions and showrooms for trends in commercial and residential furniture and interiors. These skilled observers and their teams have been watching different markets for years, if not decades, and are tuned into subtle shifts in species and grain structure changes, coloring and finishes, combinations and applications.



Manually laying up a panel design with plotter prints of lumber scans.



A flat-bed scanner used for capturing full-size pieces of lumber.



They also know their woods, and where to find them.

"I spend time at lumber yards and with lumber brokers," said Mark Smith, senior design manager for a décor printer with facilities on four continents. Décor printers combine art and technology to create printed papers with incredible detail and realism. (See sidebar below.)

"There's a lot of reclaimed or repurposed wood out there," Smith added, "and it's not all just barn wood. There are a lot of old structural beams in both rural and industrial areas of the northern east coast—some of it over 100 years old—in woods you just can't get anymore with any useable quality. Chestnut is a great example. Recent growth is all wormy, not as usable, but what comes out of these beams is clear."

When Smith visits lumber yards and brokers, however, he's not just randomly picking woods; he's armed with what he's seen the Milan Furniture Fair (Saloni), the International Furniture Fair (IMM) in Cologne, and the International Contemporary Furniture Fair (ICFF) in New York. Major office/commercial furniture fairs like NeoCon and Germany's Orgatec are also important destinations for Smith and fellow trend-watchers.

Sometimes shifts in trends are easy to spot. For instance, demand for cherry, which had been very popular over the last few years, has waned, he explained.

"It's a beautiful wood, naturally red-orange, but red as a color is not selling much right now. Everything is heading toward greys, tans, browns, and even silver. Ipé, which is 368 percent harder than teak, turns light grey with age. There's a lot of recovered ipé from the boardwalks along the east coast, and some of it made its way into furniture I saw at ICFF this year.

"You can't go anywhere without seeing walnut right now," Smith continued. "In small planks it's very popular for office furniture and hospitality design. More rustic walnuts, with more grain character, are seen in kitchens, healthcare, hospitality, and offices. Quarter-sawn looks, which have fewer cathedrals and knots, are very attractive for office furniture. When creating a laminate design, too many knots can present design challenges at the edges of desks and tables."

Butternut is also trending, said Smith, although mostly under its nickname "white walnut." "It's a lighter version of the same species," he said. "All nut trees, butternut, hazelnut, walnut, are from the same family and have similar appearances, just like fruitwoods.

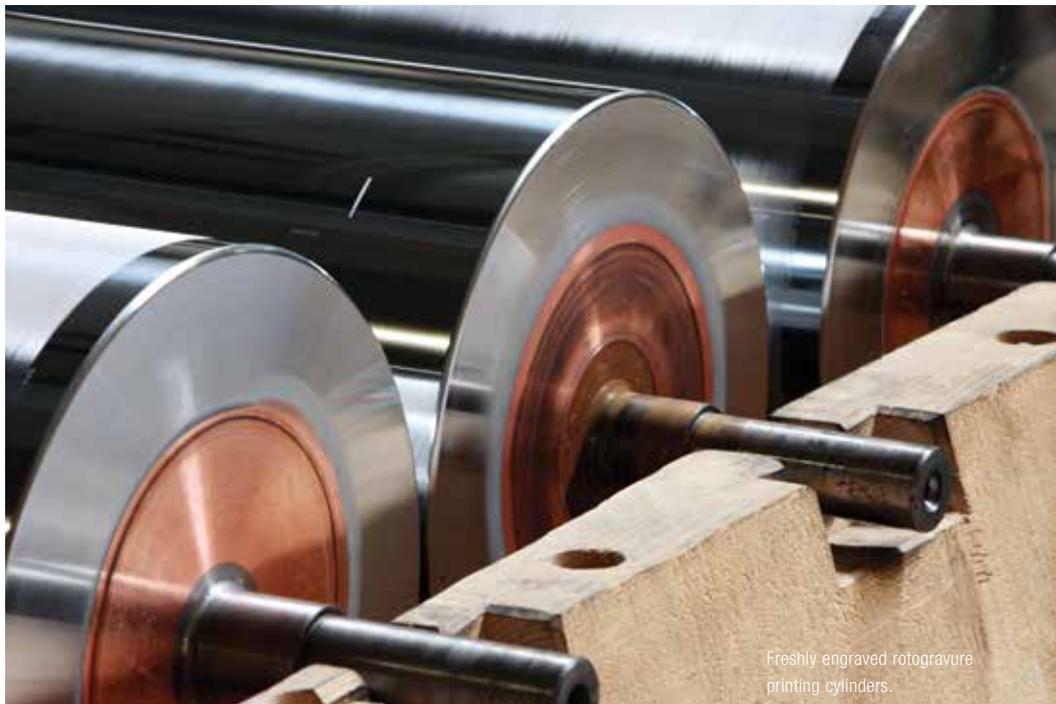
"Another big trend now is mixing different species of wood in the same piece of furniture. I recently saw flamed maple and red elm on the front of walnut cabinets, as well as other combinations," he added. "When you see several examples like this from different suppliers around the country and around the world, you know there's something going on. It's not necessarily that they're watching each other—it's more of a natural, self-driven trend."

Woodgrain imperfections are another regionally specific trend, currently more influential in Europe than in North America, particularly the contrast between sapwood and heartwood in a single panel. Every log actually consists of these two kinds of wood. Heartwood is the non-active or dormant center of a tree, usually distinguishable from the outer portion by its darker color. Sapwood is the lighter-colored living wood found in the outer portion of a tree.

"This is what I call the 'ideation phase,'" said Smith. "In addition to surveying the exhibitions and visiting showrooms, we read design blogs and magazines, and we get information from our lumber brokers about trends in the species

How Decorative Panels Come to Be, in 10 Easy Steps

1. A trend or market void is identified
2. Samples of virgin or recovered species fitting that trend are purchased from lumber brokers
3. Samples are prepped and scanned in high resolution
4. Digital scans of samples are laid out in a finished panel
5. File separations are made for each print stage, usually three or four
6. Rotogravure cylinders are engraved for lab-press testing
7. Full-size rotogravure cylinders are engraved for production machines
8. Décor base papers are ordered—either white, or solid color
9. Printed décor papers are saturated with resin required for lamination
10. Saturated papers are laminated under heat and pressure, either directly to a particleboard or MDF panel (TFL), or to layers of saturated kraft paper (HPL)



they're selling. I'm also very active in the Color Marketing Group, where I get a lot of input and insight both within and beyond the furniture markets."

SHOPPING FOR LUMBER

"From there we start the buying phase, where we visit several wood brokers and lumber yards and start looking at logs and lumber," Smith explained. "This means sorting through literally tons of wood, logs, planks, as well as reclaimed wood and beams, in several locations.

"It's more of an art than a science, and experience is key," he continued. "Most of the time we're buying based on the trends we've been observing and what we hear from our brokers. On some occasions we'll invite a customer from flooring and furniture companies with us, if they're looking for something very specific."

At the wood brokers, logs and beams are sliced into boards and run through a planer to expose the true beauty of the raw woodgrain. Pouring denatured alcohol onto the surface then makes the grain, color, and flare (or flame) pop.

"How much we end up buying depends on our goal for that species or design," Smith said. "If it's a clear, linear structure, we can create a design from 100 board-feet or even less. If we want a finished design with a lot of character, we need more virgin material, up to 200 board-feet, to ensure we have as many of the natural variations to work with as possible. This year we bought a dozen different wood species."

CAPTURING WOOD'S ESSENCE

Once the wood has been purchased, it's turned over to furniture craftsmen employed by the printers, who prepare it for scanning.

"They really know wood, carpentry, and furniture making, and understand how to reveal the essential character of each species," said Smith. "Depending on how you cut it and sand it, you can bring out different aspects of the wood's character. Generally we don't stain or finish it, because that actually reduces the quality of the scan. It's best to capture it in its virgin state; you can add finish and color effects later in the editing process.

"Plus, we archive the lumber we buy in case we want to use it again," he added. "Once you've modified its natural look, it's much harder to reuse."

Large flatbed scanners are used to capture the natural color and grain

structure, flakes and rays, and naturally occurring "flare" or "grain pop." The technical term for the 3-D iridescent flare effect is chatoyancy, borrowed from gemology to describe the cat-eye effect of certain stones.

To capture every minute detail in the wood's surface, the scanner head moves over the sample so slowly it's almost undetectable. Banks of lights on the scanner head are angled and adjusted to enhance surface texture and contrast, and to either emphasize or mask the iridescence of the woodgrain details.

"If we're scanning several samples of the same species, we'll start with one piece and scan it several different ways to bring out different parts of its character," Smith said. "Once we have what we think is the optimal scan of that sample we'll use the same setup for the rest of the samples of that species.

"At this point we're not focused on what the final color of the design might be," he explained, "just capturing the wood in its most natural state.

MANUAL LAYOUT

"When all the samples are scanned, we print out full-size plotter prints of each and begin to cut and paste, laying them out into a finished panel design," said Smith.

"Once we have that hand-made version, the layout work moves into the digital realm."

Grain, detail, and character are manipulated and blended to create a more finished mockup of what the final panel will look like, and that design then goes back to the development time—which includes the woodworkers and sometimes even the customer—who mark up what they like and don't like.

"Part of this process is making sure we're creating something that works for the intended application. For example, panels that will be cut into small pieces for furniture parts may require a different design layout than panels destined for larger-format uses on walls," Smith explained. "Then, back to the digital designers for final changes, from which we create a full-size plotter print of the panel design."

Once an approved finished digital file is in hand, color separations are created.

READYING FOR PRINT

"Most décor paper prints are made on rotogravure presses, the same technology used for high-quality graphic printing. Three or four separate engraved cylinders print each color as well as one part of the finished woodgrain, so those design



Designs are tested on a lab press before running on a full-size rotogravure press.



Samples from the lab press are checked for color and fidelity before the design moves to a production press.

details need to be initially broken down in the separation process. Each separate print stage is deconstructed individually from the master file. This is where we figure out how much of each color each cylinder will apply, and how best to achieve the level of grain detail we're after.

"The goal is to try to hit the original color of the wood sample," explained Smith. "Once you get to that point, you should be able to get the color and tones you're ultimately looking for."

Before engraving the full-size production cylinders, which are up to eight feet, the separation files are tested on a lab press, where the lab or "baby" cylinders are only two feet wide, but otherwise identical in output to the full-size machines. This is also where the ink formulations are tweaked.

"All of our inks are water-based, and have been for quite some time," added Smith. "Red, yellow, blue, and black inks are mixed to achieve the correct color for each of the different print stages, laid down by each of the print cylinders. We use ink extenders that make each color more translucent or more opaque. We can also add a percentage of white to the extender,

which can give us the effect of a limed oak with white pores, for example."

Deciding in which order to apply the inks in order to create a realistic woodgrain is certainly part of the art of the process. Everyone operating these huge printing machines has had years of training and apprenticeships.

The print-grade base paper used in décor printing is manufactured to very high specifications, because it has two very different demands placed on it: It must carry a high-fidelity rotogravure print, and it must be absorbent enough to be saturated with the resins required to press a finished laminate surface.

In most cases, a woodgrain print starts with a pre-colored paper, which eliminates the need for laying down a solid-color "pad coat" of ink in the first printing stage.

"We use many different base papers in specific colors," Smith said. "They're produced on a monthly cycle, from light to dark, which means the paper manufacturer only has to shut down the machine for cleaning once a month to minimize contamination from paper to paper. This means if you don't order enough paper for a run, you could be waiting a month for them to run that color again."

Better than Carbon Neutral... and More

Why are decorative TFL wood panels one of the most responsible choices for furniture and interiors? Let us count the ways.

- ▶ The composite wood panel substrates in these panels sequester more carbon than is used in their manufacture, transportation, value-added processing, and installation. (For more information, see the CEU "Composite Wood Panels: The Big Green Picture" in our April 2015 issue.)
- ▶ The recycled wood fiber used in TFL substrates would otherwise be landfilled or incinerated.
- ▶ Printed décor papers replace wood veneers, saving virgin trees and rare or exotic species.
- ▶ Décor prints of reclaimed wood allow designer to specify species that are no longer viable or available.
- ▶ Decorative TFL panels are far more stable, durable, and easy to maintain than veneer or solid wood, so they'll last much longer in an installation.
- ▶ Unlike with wood and veneers, you can get an exact match years from now should you need to replace a damaged panel or component.
- ▶ The designs discussed in this article are shared with other material manufacturers, allowing you to choose the best surface for the job without sacrificing design harmony.

ANATOMY OF A DESIGN LAUNCH

When a large decorative thermally fused laminate (TFL) panel producer in the Pacific Northwest decided to add some new prints to its top-selling collection, it partnered with a major décor printer to locate and tweak designs that would at the same time pull their entire collection forward, but still fit into their current offering.

"The project was not simply to pull off-the-shelf designs that are 'pretty' or 'popular' and try to shoehorn them into the collection," explained Peter Garlington, design director for the global décor printer. "We do not believe that one size fits all. Rather, we looked at the hard work already done by our client in focusing on the core of its collection, which is very solid, to see if and where additions would work and what would have the most impact."

Four new designs were chosen "based on color and contrast values as well as the scale of the structures," Garlington said.

"The color and contrast values were chosen to be market-relevant now, and to address the growing color trends of complex grays and complex neutrals," he added. "Each design was stepped and balanced to work well on a 4- by 8-foot panel, and checked for color and structure for harmony across the sheet. We then checked a half sheet, quarter sheet, and one-eighth sheet both horizontally and vertically to ensure usability for both large panel- as well as small part-cutting, and adjusted the design as needed."

Three of the designs are balanced linear structures, which have grown beyond a simple trend to a completely separate design category. **IS**