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KNOW THE TERMS

The first step in mastering a craft is to learn the terminology

BY BOB FLEXNER

Successful communicating relies on all of us meaning the same thing with the words we use. Here are the core terms in finishing you should be familiar with:

FINISH is a substance that changes from a liquid to a solid after it's applied to the wood. The purpose of a finish is to protect the wood and enhance its appearance. By adding colorant to a finish (called a binder in this situation), you can make a stain, glaze, toner or paint.

FILM FINISH is any finish that can be built (by repeated applications) to a hard, thick layer, or layers, on top of the wood. The key requirement for a film finish is that it must dry hard. Alkyd and polyurethane varnish, shellac, several types of lacquer, water-based finish and various two-part high-performance finishes are all film finishes. Wax and any finish that contains mixed-in rather than cooked-in oil cannot be a film finish, because wax and oil dry too soft to be functional in any thickness.

PENETRATING FINISH is a somewhat misleading term used to designate linseed and tung oil that don't dry hard, so they can't be built up to a functional film. The misleading part is that all finishes penetrate. Nevertheless, "penetrating" is the term most commonly used for oil finishes.

SEALER is the first coat of any finish. The first coat penetrates, dries, and seals the pores so the next coat of finish (or any other liquid) has difficulty going through to the wood. The sealer coat also locks raised wood fibers in an up-right position causing the surface to feel rough. To achieve a smooth final finish, you should sand the sealer coat smooth before applying additional coats. Special sanding sealers are made for alkyd varnish and nitrocellulose lacquer that gum up sandpaper when sanded. Sanding sealers powder when sanded. But sanding sealers weaken the toughness and water-resistance of the total film build, so you shouldn't use more than necessary for easy sanding.

WASHCOAT is a highly thinned coat of any finish. It is used to partially seal the wood, or to form a barrier between two potentially interfering layers of color. A washcoat reduces uneven staining on raw wood by limiting stain penetration into highly porous areas such as end grain, swirly grain and areas surrounding knots. A washcoat also prevents stain, glaze, and pore-filler colors from running together while adding only a minimum of film thickness.

THINNER (mineral spirits, naphtha, lacquer thinner, alcohol, water) is any evaporating liquid that can be used to thin a finish, stain, glaze or pore filler so it can be applied with a brush, cloth or spray gun.

SOLVENT (mineral spirits, naththa, lacquer thinner, alcohol, water) is any evaporating liquid that will dissolve a dried finish, stain, glaze or pore filler. Often a solvent for a dried stain or finish is also the thinner for that stain or finish in liquid form.

SHEEN is the degree of gloss in a dried finish. Most film finishes dry to a gloss sheen unless they have flatting agents (gloss-reducing solid particles) added. Semi-gloss, satin and flat varnishes, lacquers, and water-based finishes have had flatting agents added. These finishes must be stirred before use to put the flatting agents into suspension.

STAIN changes the color, tone and/or shade of wood. There are two kinds of colorant used

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in stains: pigment and dye. Pigment particles are opaque and resemble colored earth. They settle to the bottom of the can and must be stirred into suspension before using. Applied to wood, pigment lodges in cavities, such as pores and sanding scratches, large enough to hold it. Built up on wood, pigment obscures the wood like paint. To glue the pigment particles to the wood, a binder (oil, varnish, lacquer or water-based finish) must be included in the stain. Dye is transparent. It dissolves in a specified liquid. Once dissolved, dye remains in solution. Applied directly to wood, dye penetrates into the wood and thus doesn't need a binder. Some commercial stains contain both pigment and dye.

GLAZE is pigment stain with a higher ratio of binder (varnish or water-based finish) to pigment, so increased thickness is possible. A glaze is thick enough to stay where you put it on a vertical surface. You can use a glaze to darken or change the color tone of wood after the wood has been sealed. You can leave a glaze in the recesses of carvings, turnings and moldings to give the appearance of age and greater depth. You can feather out a glaze to highlight certain areas, like the centers of cabinet doors. Or, using special glazing tools, you can make patterns in a glaze that resemble wood grain or marble. When the glaze is dry, protect it from being scratched off by applying one or more coats of a clear, film finish.

PORE FILLER is essentially a glaze with silica (similar to fine sand) added to provide bulk. Pore filler is used to produce a mirror-flat effect by filling the pores of porous woods such as quarter-sawn oak, mahogany and walnut before the application of a film finish. Pore filler won't take stain well once it has dried, so pigment should be added before application. You can apply pore filler directly to raw wood to fill and stain in one operation, or you can apply a different color filler to a sealed (and stained) surface to highlight the pores.

TONER is finish with dye or pigment added and thinned with up to six parts thinner. Toner adds color in very thin layers without penetrating into the wood. Toner can be used to change or adjust a color after the wood has been sealed but under a topcoat.

SHADING STAIN is a toner used to change or adjust the color of certain parts of wood without affecting other parts. Shading stains can be used to match sapwood to heartwood and to highlight certain parts, such as the centers of cabinet doors, by darkening the surrounding areas.

RUBBING AND POLISHING is the procedure used to level the surface of the final coat of finish and raise or lower the sheen. Various abrasives, including fine sandpaper, steel wool, abrasive pads and rubbing compounds, are used. Sandpaper removes dust nibs, orange peel, brush marks and other imperfections in the surface. Steel wool, abrasive pads and rubbing compounds (fine abrasive powders in a liquid or paste) raise or lower the sheen. ■

PHOTO: MICHAEL GORDON

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FINISHES THAT ARE JUST GETTING STARTED

A look at new coatings for cabinets, furniture, millwork, special effects and exterior applications

BY JOHN ENGLISH

There's a lot of new product development in the world of coatings. Almost a decade of economic stability and a strong housing market have encouraged manufacturers to invest more in research and development.

Last November, Axalta *(axalta.com)* opened its new Global Innovation Center. The 175,000-sq.-ft. facility offers unparalleled specialty labs and is now "the central hub for our global research, product development, and technology initiatives where we develop and deliver the most innovative coatings products in the world," said interim CEO Robert Bryan.

In 2018, Woodshop News reported the opening of PPG's new industrial wood coatings laboratory at its facilities in Springdale, Pa. At the time, the company's vice president of industrial coatings, Kevin Braun, noted that "there are three main factors driving coatings development across the wood and interior building product segments. They are differentiation through color and aesthetics, product durability and improved process efficiency to control manufacturing costs."

The first two of those three factors have a direct impact on how woodshops coat cabinets and furniture.

COLOR AND AESTHETICS

Spiced Honey. That's AkzoNobel's color of the year for 2019 *(akzonobel.com/en)*. Sounds delicious, doesn't it?

Not so long ago, cabinetmakers would have paid little attention to such things. That was back when paint colors were for walls, and cabinets were simply stained and clear coated. The biggest question was one of sheen. But now the research done by companies such as AkzoNobel and Pantone *(pantone.com)* plays a vital role in how woodshops market, and color, their casework.

Pantone's 2019 color is Living Coral, where the marketing literature shows fish on a coral reef. Color has become so central to what we now do (less than half the custom cabinets being built exhibit natural wood grain) that the concept of coatings has expanded from varnish and lacquer to include paint and tinting.

Another industry giant, PPG *(ppg.com)* has gone down a different road when choosing its 2019 color of the year – one that is far removed from the golden tones of Spiced Honey or the soft pink of Living Coral. The company's decidedly dark and masculine Night Watch is "a rich, luxurious, and classic shade of green". The intention here was to evoke the response one feels when looking out a window at lush growth.

Behr Paint's 2019 Color of the Year is Blueprint S470-5, which is a mid-tone blue that is "warmer than denim and softer than navy," according to the company *(behr.com)*.

So, gold, pink, dark green and blue ...

Where does that leave a woodshop? Which way should one jump when choosing a new shade for the showroom cabinets? Well, the answer lies in timing. The coatings manufacturers are looking backward and forward at the same time when they make these selections. Their color-lab people explore the world all year searching for trends and innovation, and then try their best to predict what's hot and what's not. But in doing so, they actually affect the trend. That means the Color of the Year selections are, in a way, a self-fulfilling prophecy because designers pay a lot of attention to them, and then use the tones in their schemes. That also means that, because the choice affects the trend, there isn't always a lot of movement from year to year.

For example, PPG's 2018 color was black, so it has lightened up a little in 2019 but is still on the darker wing of the spectrum. Pantone's pink has replaced last year's light purple, and AkzoNobel's 2018 choice, Heart Wood, was "a

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PHOTO: BRIAN CASSIDY / REDUX PLUS

gentle grey-pink" that shares the pastel pallet of Spiced Honey. And Behr's choice was 'In the Moment', which has undertones of blue, gray, and green (again, their color this year is a blue).

Perhaps the best way forward for woodworkers is to acquire or create samples of all of these colors, and then just let the employees choose. That way, you're working with a limited selection but not restricting expression.

POWDER COATING

One of the most promising vehicles for delivering durable color options in the casework field – and especially in the medical and laboratory cabinet markets – is the emergence of powder-coated MDF. In a December 2018 interview with Coatings World editor Kerry Pianoforte, AkzoNobel's business unit director Daniela Vlad spoke to developments in this area.

"Everything we do is driven by market needs and providing more sustainable solutions for our customers around the world," she said. "Whether that's reducing baking temperatures, removing process steps through dry-on-dry-application, improved material usage through lower applied film builds, improving the longevity of the coated article through improved UV durability/corrosion-protection performance, or adding

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more functionality to the coatings. Providing the ultimate powder solutions and helping our customers to reach their sustainability goals are at the core of our work. Our ambition is to make powder coatings available to as many markets as possible, as it is a very sustainable technology."

The company is expanding the capabilities of powder coatings with its new Interpon AM line that includes BioCote to combat the growth of microbes such as bacteria and mold. It is typically used in hygiene conscious environments such as hospitals, clinics, changing rooms, schools and public transport.

Powder-coated MDF has been around for a while and the technology has made some major strides in the past couple of years. Bern Fitzgerald, founder of Integra Doors *(integradoors.com)*, points out the advantages of this coating option. "A powder-coated kitchen means no more VOCs or HAPs are being emitted," he says on the company's website. "Simply put, powder coating leaves a very low carbon footprint."

BTD Wood Powder Coating *(btdwoodpowdercoating.com)* in Brainerd, Minn., points to the many tactile and visual advantages. The company says that its t.fusion coating thermally fuses and cross links custom color polymers to an MDF substrate. "Powder-coated wood doesn't peel or chip like liquid paint and, because it's seamless, it won't delaminate or experience edge-band separation. It can also withstand high degrees of temperature change and exposure to moisture, and it holds up beautifully in high traffic areas," according to the company.

One other aspect of powder coating is its versatility. For example, BTD offers both ultrasmooth and textured finishes such as metallic, clear coat, hammer-tones and veins. Specialty finishes allow casework designers to create visual interest with effects that are unique to this type of coating.

PRODUCT DURABILITY

Toughness is essential in a topcoat, and AkzoNobel released a new one-pack waterborne product about a year and a half ago that addresses this. AqualitColor AC-T475 can be used with a wide range of the company's fillers and primers, such as Chemcraft Aquaprime. It was specifically designed for hardness, high scratch resistance, good metal marking resistance and very good stacking properties. "The product provides a significant upgrade from current industry norms. The performance against tough staining agents such as mustard, red wine and coffee are particularly impressive, making AC-T475 especially suitable for kitchen cabinets and furniture," according to the company.

Last year, Milesi *(milesi.com/en)* introduced its Block Chain Addition (BCA) at IWF 2018. The company's parent company, IVM Chemicals Inc., describes BCA as "an unprecedented category of wood coatings capable of concentrating – for the first time in a single technology – the finest characteristics of pre-catalyzed and post-catalyzed polyurethane, acrylic and ureic finishes."

One of the most appealing aspects of BCA products is that they are 'green'. They contain no aromatic compounds, isocyanates or formaldehyde.

And a new pre-catalyzed line from Milesi is described as "a complete solution for clear and pigmented systems, setting new standards in thin film technology". They can be tinted using Milesi's KMT10 series of pastes in any color requested by the market, according to the company.

Ontario-based M.L. Campbell *(mlcampbell.com)* recently introduced two new product lines, Polarion and Agualente. Polarion is an interior acrylic polyurethane system consisting of sealers, primers, and clear and pigmented topcoats. It comes in a full range of sheens using just one catalyst and mix ratio. Agualente is a one-component, VOC-compliant coating system for interior wood surfaces.

Shops that need to bring out wood's natural, rich beauty should visit Axalta's new flipbook online and take a look at the Graintone Plus Premium color system. The special formulations in this series highlight and enhance cabinets, tables, furniture, and other interior wood surfaces where vibrant color development is desired. And Axalta's Luster Lac nitrocellulose sealers and lacquer topcoats are designed for interior fixtures, furniture, and new construction where a versatile coating is required. For kitchen cabinets, the company's Ultraguard Conversion Varnishes can handle moisture and other daily substances. And for extra durability, have a look at Amarium precatalyzed and conversion lacquers.

Zenith has a new low-VOC, HAPs-free product line formulated with a proprietary blend of self-crosslinking acrylic and urethane resins, and developed for the European market.

WORKING OUTSIDE

Everlast is an interior/exterior wood finish from Hood Finishing Products *(hoodfinishing.com)*. The company says the latest iteration delivers high durability in a polyurethane with the richness and beauty of a varnish and Tung oil, yet without that obnoxious odor.

Woodshops that build painted outdoor furniture or architectural components might want to take a look at PPG's new Permanizer. It's an exterior acrylic coating that uses a new resin technology. Even though it's waterborne, it can be applied at temperatures all the way down to 35-degrees F, according to the company.

Another exterior product, Ascend from Old Masters *(myoldmasters.com)* is a new water-based coating that contains ultraviolet absorbers for advanced sun protection.

Rustoleum's Modern Masters has rolled out a new line called Exterior Metallics. These colors can be applied by brush, roller or spray to exterior architectural wood surfaces such as window mullions and paneling. They don't require a protective topcoat, which saves project time and money. Also included in the program are Cool and Warm Tone Primers.

UNIQUE FINISHES

Available in both clear and white, Crackle lacquer from Gemini Coatings, *(gemini-coatings.com)* is "a special effect coating that allows the finisher to produce varied antique looks. This product may be sprayed, brushed, or padded on for different effects. This finish is designed to separate or 'crack', revealing the coating beneath, whether colored or natural. The size of the crackle pattern can be varied by the amount of material applied. Many different looks can be achieved by using different basecoat colors, tinting the crackle itself, and applying different colors of glaze over the crackle," according to the company.

Pearl Effects is a line of water-based, acrylic, pearlescent paints from General Finishes *(generalfinishes.com)*. They can be applied to the company's water-based stains, paints, and topcoats to produce shimmering, metallic effects.

Another innovative coating is AcromaPro's Aqua Chroma Glaze *(acromapro.com)* that delivers an antiqued look, and it can be either sprayed or wiped on. It has been formulated to be used with the company's waterborne systems and within most of its solvent systems.

The company's Glazing Stain Neutral New is a tintable neutral or clear solvent-based glazed that was designed to accent or antique interior woodworking. It can be applied as a wipe stain for raw, interior wood surfaces.

Shops in a hurry might take a look at Minwax's One Coat Polyurethane *(minwax.com)*.

And shops looking for a more natural alternative may be interested in three products from Colorado-based Unearthed Paints. The company's Hard Wax Oil is mostly used as a floor finish, providing a natural alternative to polyurethane. It can also be used as a hard finish on furniture. Safflower Wax is used for the final treatment of interior wooden surfaces such as furniture, doors and wood paneling. And Carnauba Wax can be used as an additional layer of protection on wood flooring during the finishing process or can be added to the water you mop your floor with for regular floor care. ■

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TEN FINISHING RULES THAT EXPLAIN SO MUCH

BY BOB FLEXNER

Over the years I've found myself repeating certain phrases that apply to various situations. I call these phrases "rules" because they are almost always true. Here are ten of the most common.

1 When sanding wood or finish, choose a sandpaper grit that removes the problem efficiently without creating larger-than-necessary scratches.

For example, choose a coarser grit (say 80 or 100) to remove severe washboarding caused by a jointer or planer, but begin with 150-grit when sanding factory pre-sanded veneered plywood or MDF. Choose an even finer grit if you're just checking that your stripper has removed all the old finish.

Or, choose a coarser grit (say 180 to 320) to remove brush marks or orange peel, but a finer grit (320 to 600) to remove dust nibs.

2 The first coat of any finish seals the wood; all additional coats are topcoats. In other words, it makes no sense to apply two sealer coats. Products that are sold or promoted as sealers don't seal the wood any better than the finish itself. However, they do solve a problem.

Sanding sealers make sanding easier, so they speed production. Sanding sealers and vinyl sealers provide better "hold-out." They partially block the pores, so they are used to produce a more level finish. Shellac acts as a barrier against oil, especially silicone oil, which causes fish eye, or oily resin in exotic woods such as cocobolo and sometimes teak, or residue wax in the wood from using a paint stripper. Shellac also blocks odors in the wood from cat urine, for example.

3 There are only three tools used to apply finishes: a rag, a brush, and a spray gun. All three are simple to use. Even a spray gun is no more complicated to use than a router.

All finishes can be applied with any of these three tools. A rag is a cheap and efficient tool for applying a stain or finish that you intend to wipe off, but rags leave very deep ridges in finishes when you are trying to build a film. A brush is an inefficient tool because it is so slow, but it is the least wasteful of finish material. A spray gun is fast and applies the most level film. But, spray guns are the most expensive tools and, because of overspray, they are wasteful of finish material and require an exhaust system.

4 The only thing you can do in finishing that can't be fixed fairly easily is to blotch the wood with a stain. All other problems can be fixed, with the worst case being that you have to strip off the finish and begin again. To fix blotching, you have to sand, scrape, or plane the wood to below where the stain has penetrated.

Amateur woodworkers often forget this rule. They think that they will ruin their woodwork if they make a mistake with the finish. Professional finishers and refinishers know from sad experience that having to strip and start over is not that uncommon, and also, not that devastating.

5 Apply a wet coat of stain and wipe off the excess before it dries. This is the basic instruction for applying all stains. The exception is when you spray the stain and leave it as sprayed.

The reason you get a darker color if you leave the stain wet on the wood for longer is not because it soaks deeper as is commonly believed, but because some of the thinner evaporates leaving a higher colorant-to-liquid ratio. With some stains, especially dye stains that don't contain a binder, you can get a darker color by applying a second coat. But the second coat is less effective with stains that do contain a binder because the binder partially seals the wood.

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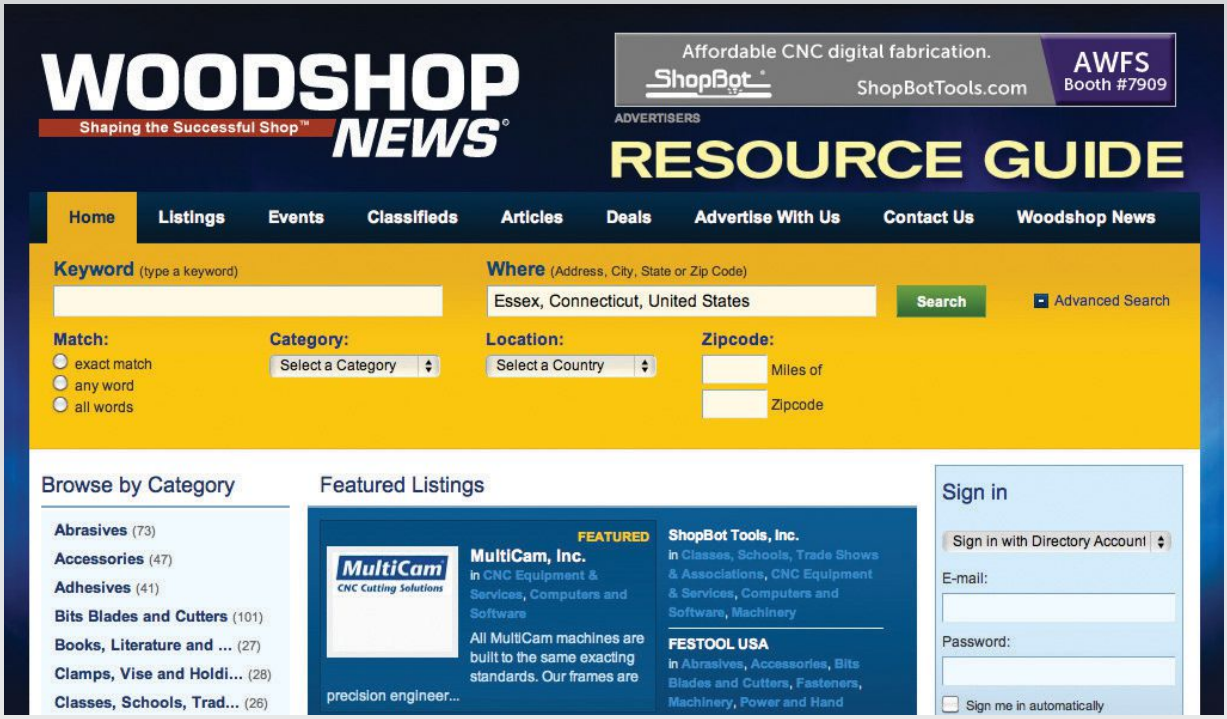

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The reason some stains color wood darker than others with just one coat, even when all the excess is wiped off, is that they contain a higher ratio of colorant (pigment or dye) to liquid (binder and thinner).

6 Dye dissolves, pigment suspends and settles. Dye, therefore, penetrates into the wood everywhere the liquid does. But pigment only lodges in pores and sanding scratches large enough to hold it. This difference is responsible for the different effects you get from these two colorants. Dye colors wood more evenly and thoroughly than pigment. Pigment highlights grain better. Keep in mind that dye also fades much quicker than pigment.

7 Thinning a finish more is the solution to the most common application problems – brush marks, orange peel, and air bubbles drying in the finish. But thinning reduces the film build, which may cause you to have to apply an extra coat or two of finish.

8 Pull the trigger and keep the gun moving. This is the basic rule for using a spray gun. For some reason, writers in magazines and books have made using a spray gun seem difficult. As long as you keep the spray gun clean, well-tuned, and adjusted correctly (which is not at all difficult), there is only a little hand-eye coordination involved in learning to use the tool. Basically, the coordination can be summed up by the instruction to keep the gun moving while the trigger is pulled.

9 Finishes bond to each other in two ways: chemically and mechanically. Chemical bonding occurs when the applied coat dissolves into the existing coat. Because of the way they dry, by solvent evaporation, lacquer and shellac are the best examples of this. To a lesser degree, water-based finishes are also an example. Catalyzed finishes have an open time during which they

PHOTO: ZACK STOVALL / REDUX PLUS

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PHOTO: ZACK STOVALL / REDUX PLUS

dissolve into themselves, and after which they don't. When there is chemical bonding, there is no need to sand between coats to improve the bonding, only to remove dust or other flaws.

Mechanical bonding is created by scuffing a surface with an abrasive, such as steel wool or sandpaper. It helps to create mechanical bonding when the newly applied finish is not likely to dissolve into the existing surface. Examples include applying varnish or polyurethane over an old finished surface, or applying any finish over a fully cured catalyzed finish.

10 An old unknown finished or painted surface should be clean and dull for successful recoating. If there is grease or dirt on the surface, or if the surface is glossy, a new coat (paint or finish) may not bond well. But if an old surface is clean and dull, any new paint or finish should bond well.

You can clean a surface by washing with soap and water or removing the grease or dirt with an abrasive such as steel wool or sandpaper. You can dull a surface by abrading with steel wool or sandpaper, or washing with tri-sodium phosphate (TSP), ammonia, or alcohol. Because these also clean, they accomplish both. ■

4

PETROLEUM DISTILLATES

These are arguably the most useful of all the solvents available to most of us

BY BOB FLEXNER

As you are surely aware, solvents are under attack because most cause pollution. Actually, all do, but some much less so than others, so they are classified as "exempt" solvents. Only these exempt solvents are available to the consumer market in some parts of the country. An example of an exempt solvent is acetone.

I don't live in a restricted area, so I can still buy and use all the solvents discussed in this article. And I'm glad I can, because I love solvents for the versatility they provide in finishing.

Most solvents also smell bad and can make you feel light-headed if you breathe them for too long a time. So, you should always arrange for good ventilation, meaning air movement in and out of the area you're working in, not just opening a window, and wear personal protection gear.

PETROLEUM DISTILLATES

Probably the most common solvent you see listed on cans of finishing products is petroleum distillate, which is a distillation from petroleum. The most common petroleum distillate is mineral spirits, which is also known as paint thinner.

Mineral spirits has replaced turpentine, which is a distillate of pine tree sap, for most applications in finishing. Mineral spirits is less expensive and has less odor than turpentine. A few painters still prefer turpentine for thinning varnish and oil-based paints because they like the feel it gives to the material while brushing.

Benzene, toluene, xylene, naphtha, kerosene, mineral oil, paraffin wax, and the major part of gasoline are also distillations of petroleum. Taken as a group the solvents in this list are also known as hydrocarbons because they are made up entirely of the elements hydrogen and carbon.

HOW IT'S PRODUCED

To produce petroleum distillates, crude oil petroleum is heated until gases form. The gases are drawn off and allowed to cool back into liquid form. As the petroleum is heated to higher temperatures, the gases that are cooled form different products.

For example, at relatively low temperatures heptane and octane are distilled to be made into gasoline. At higher temperatures naphtha, usually sold as Varnish Maker's and Painter's (VM&P) Naphtha, is derived. This is followed by mineral spirits and then kerosene.

Mineral oil (also called paraffin oil) is distilled at even higher temperatures, and paraffin wax (used to seal jelly jars) at still higher temperatures.

PETROLEUM FRACTIONS

Each distillation is called a petroleum fraction. The relationship between the fractions is important because it helps you understand these solvents so you know when to use each.

The lower the fraction – that is, the lower the temperature required to form a gas, the faster evaporating, more flammable, and less oily the solvent. Gasoline evaporates faster, is more flammable, and less oily than naphtha. Naphtha evaporates faster, is more flammable, and less oily than mineral spirits, etc. All fractions of petroleum can be mixed together.

Gasoline is a very dangerous solvent to use in finishing because it is so flammable. You sometimes see gasoline recommended in old books for cleaning, but this is because it was more widely available at the time than alternative petroleum-distillate solvents. You should avoid using gasoline in finishing.

Naphtha is much safer to use when you want a solvent that evaporates relatively fast or is non-oily. Naphtha is effective for cleaning and degreasing, and for thinning products such as glaze or pore filler when you want the thinner to flash off quickly.

Use mineral spirits when you want a slower-

evaporating solvent and you don't mind the oiliness. Mineral spirits is good for thinning oils and varnishes.

Kerosene is not used much in finishing because it evaporates much too slowly, and it is very oily.

Most furniture polishes are made from fractions of petroleum distillate in the range between mineral spirits and kerosene. The manufacturer chooses the fraction that will evaporate at the desired rate. The petroleum smell is, of course, removed and replaced with a lemon or other more pleasant scent.

BENZENE, TOLUENE, AND XYLENE

Benzene, toluene, and xylene are the strong and smelly parts of naphtha and mineral spirits. Refineries can remove these parts with chemicals and further distillation. What's left is odorless mineral spirits.

Benzene (also called benzol) was once used as a thinner and paint stripper, and you still see it recommended now and then for these purposes in old books.

But benzene is carcinogenic and was removed from the consumer market in the early 1970s. Mineral spirits and naphtha contain only a trace of benzene.

I love solvents
for the versatility
they provide in finishing

Benzene is often confused with benzine, which is another name for naphtha.

Toluene (also called toluol) is used as a diluting solvent in lacquer thinner. Xylene (also called xylol) evaporates more slowly than toluene. Both solvents are often included in solvent-based paint strippers, and xylene is sometimes used as a thinner in catalyzed (conversion) varnish.

Both toluene and xylene are very dry – that is, they are not oily. So, both solvents can be used for removing oil and grease. But because both solvents are relatively toxic, it's usually better to use naphtha for cleaning.

Two very interesting uses for toluene and xylene are to remove latex paint spatter and to break down white and yellow glue.

Both toluene and xylene break down latex paint. But neither damages any common finish except wax and water-based finish unless left in contact for an extended period. hus, both solvents can be used to remove latex paint spatter from all furniture and cabinet finishes except wax and water-based finish without damaging the finish. You may have to rub a little with a solvent-dampened cloth to get all the spatter off.

Toluene and xylene can also be used to remove glue that has seeped from joints or been deposited on the wood by your fingers. As with paint spatter, you'll need to scrub a little and maybe use a toothbrush or other soft brush to get into pores.

Though it takes a little effort, you can also use toluene and xylene to aid in breaking apart edge-to-edge joints glued with white or yellow glue. Xylene works better because it evaporates slower. Squirt some of the solvent into a crack in the joint using a small syringe. Keep the joint wet with additional solvent and pry at the joint with a screwdriver or similar tool. Mortise-and-tenon, dovetail and dowelled joints are usually too difficult to get into for this technique to work. ■

5

COMPLIANT AND USER FRIENDLY

The latest trends in new finishing equipment also include reduced pressure, enhanced atomization and improved ergonomics

BY JOHN ENGLISH

The finishes being used on casework and furniture have undergone a major metamorphosis over the past decade or so, as technology both leads and follows aesthetic trends. It leads by offering new solutions such as enhanced UV coatings and environmentally sound sealers and topcoats, and it follows as the market continues to move away from traditional wood stains and clear coatings toward solid colors and lower maintenance solutions.

One thing doesn't change – woodshops still have to find the best way to apply coatings.

REDUCING PRESSURE

One of those ways is a trend toward reduced pressure (RP) equipment, which is in part a solution being adopted by manufacturers to meet a federal EPA mandate on emissions. These new guns have redesigned spray heads that also accommodate the latest EU rules on VOCs regarding the relationship between pressure and overspray. Requiring high transfer efficiency ratings, they are known in the industry as 'compliant' guns.

RP seems to be especially well-suited for urethanes and high solid materials. These guns can deliver product faster than traditional HVLP setups while they consume about half the air volume, and there seems to be a consensus that they deliver a better quality clearcoat. They are also suitable for applying base coats, although many shops report that they have stayed with the HVLP gun for that because of lower overspray, and also for spraying waterborne product. Some users, especially automobile painters, say that they tend to push the PSI settings up a little over the recommendations for RP guns, and this tends to reduce or eliminate orange peel.

Fuji Spray's new MPX-30 gun is a good example of the newest generation of RP guns. It works with a shop's standard air compressor, rather than requiring a turbine, and it comes in either gravity feed or siphon models. A high-pressure regulator gauge is included, and the recommended operating pressure is 13.8 cfm at 36 psi. The MPX-30 will handle solvent-based coatings, plus low VOC colors or clearcoat. Its stainless-steel passages are suitable for waterborne coatings, too.

Another high-end gun, the SATAjet 5000 RP comes with a 1.3mm nozzle and a precision air pressure gauge (adjustable to ± 0.10 bar accuracy). Easy to operate, the gun provides relatively simple control of fan shape, material flow and air consumption.

The new SATAjet X 5500 became available in the U.S. and Canada last November. Developed

WS-400 Evotech from Anest Iwata.

The SATAjet X 5500 RP.

The DeVilbiss AG-363 automatic spray gun series.

RX-Apex from Titan.

in co-operation with Porsche's design studio, it's equipped with the company's X-nozzle system and has two distinct spray fan shapes for each nozzle size – parallel and oval-shaped. It's very quiet, matches any paint material, climatic conditions or painting method, and has a much easier and faster cleaning process than traditional guns. It's very precise because of enhanced atomization, and with constant fan size across the entire nozzle spectrum, it's quite consistent. As with the latest generation of guns from most manufacturers, a woodshop can choose between HVLP and RP versions, and also between the two different spray fan shapes for each individual nozzle size. Both the 5000 RP and the X 5500 are available with or without an integrated digital/non-digital pressure gauge.

Enhanced atomization is becoming a marketing catchword. In fact, Apollo Sprayers is stressing its value with the newest 7700T, which the company calls the Atomizer. It offers new MicroTech technology for atomizing particles. Other innovations include an improved air distributor and a three-turn air cap design that makes changing nozzles and needle sizes quick and easy. There are five standard caps and three high solids caps available. All wetted internal parts are engineered from marine-grade stainless steel with no O rings.

HANDLES AND APPS

In addition to regulatory compliance and more efficient delivery, spray equipment manufacturers are paying more attention to ergonomics, too.

The RX-Apex is a new airless paint spraying gun from Titan (*titantool.com*) and it comes with a choice of four different handle grips for various sized hands, plus some angle tweaks. The gun is designed for high-volume paint and high-performance protective coatings applications, and it also has the company's All-Day trigger system. A built-in free-flow swivel makes maneuvering the gun easier and less restrictive, and shop managers will appreciate the Infinity Packing system that doubles the life of the gun and makes rebuilding as easy as reversing the seat and changing the ball.

Graco (*graco.com*) launched four electric and two gas airless sprayers in February that feature the new Endurance Vortex MaxLife piston pumps and a new app that tracks job progress and manages sprayer performance.

Graco also presents two proportioner options. The ProMix PD positive displacement system mixes material close to the gun, which not only makes color changes faster, but also reduces flushing waste by up to 80 percent. The ProMix 2KS and 3KS are meter-based systems that increase efficiency for mixing two- and three-component materials.

Carlisle Fluid Technologies (*carlisleft.com*) offers the AG-360 automatic LP gun series from DeVilbiss that lets a woodshop choose between a large menu of caps to meet goals related to environmental compliance, transfer efficiency, atomization power and application requirements. Their stainless-steel passageways cater to both water and solvent bases, and they have independent fan, atomizing and trigger air.

Carlisle's Ransburg division offers the Aerobell, which is a compact, high speed rotary atomizer, and the Aerobell 268 that delivers high speed electrostatic bell rotary atomization along with 3-color, 3-purge functions. And Carlisle's BGK division now offers gas catalytic infrared ovens that cure powder or liquid while using less floor space, less equipment and less time. The company offers a number of state-of-the-art guns including the DeVilbiss Tekna ProLite, FLG4 series, the Binks AA1600M airless gun, and the AG-363 air-assisted automatic gun.

Anest Iwata (*anestiwata.com*) continually updates its guns, including the highly reviewed Supernova family that includes the compliant WS-400 Evotech. The company has a handy chart on its wood applications webpage that lists its various product ranges according to shop size.

Woodshops with higher production levels can find several automatic setups at Cefla's site (*ceflafinishing.com*). They are arranged according to task and the size of the production run, whether small, medium or large. It's a very helpful way to start a search, especially for shops that are not completely familiar with all the latest options. ■

6

TWELVE WAYS TO INCREASE PROFITS

BY BOB FLEXNER

There are two primary ways you can increase your profits over and above what you pay your employees. Charge more for your work or reduce your costs. Here are a dozen suggestions for reducing costs.

TRY LESS EXPENSIVE FINISHES

This is the obvious one, but it comes with a caveat. You may also be lowering the quality of the work you're turning out. But in my experience, you really don't know. The one thing I do know is that more expensive finishes, stains, etc. aren't always better. So it may be that lower-cost products still give you the quality you want.

To find out, you're going to have to do some tests. Do the cheaper products spray just as well? Do they give you an equivalent build? Do they dry fast enough and get hard enough? You'll need to determine the answers to questions like these. But you should notice differences pretty quickly if there are any.

MAKE THE SWITCH

If you haven't already switched from high-pressure to HVLP spray guns, do it. You'll have much less bounce-back and waste. Bounce-back is often called overspray, but it is the finish that bounces back off the object and gets caught up in the flow of air that is exhausted. Overspray is the spray that partially or totally misses the object and can be reduced just by improving your spraying technique.

Keep in mind that you don't have to switch from a compressor to a turbine to get the reduced force that comes with HVLP. Most manufacturers make HVLP guns that work with compressed air.

MOVE THE AIR

You need to have good exhaust for two reasons. The first, of course, is health. It's unhealthy to have solvent and atomized finish floating around the finishing area. A mask doesn't protect well enough. This is true even for water-based finishes.

The other reason is to prevent the atomized finish from settling back on your work and creating a rough surface. The air movement should be strong enough to pull the bounce-back off the work.

LIGHTEN UP

For quite some time in my early days I was doing my finishing in the back of my shop, where there was very poor lighting. When I built a separate spray room and installed excellent lighting, the difference was profound. I could see! And my work improved. Having to do serious repairs or do-overs became rare.

The temperature of the light affects color. You could be matching the color perfectly in one light only to discover that the match isn't that good in another light. It's always best to do the color matching in the same light the object will end up in, but this is usually not practical. So compromise by using full-spectrum fluorescent lighting to bring out all the colors.

DON'T SKIMP

Use high-quality abrasives. This is not a place to save money. Not using high-quality abrasives can lead to swirls due to the unevenness of the abrasive grains, inconsistent staining, or leave the wood in such poor condition that it takes more finish to produce a smooth result.

Related to using quality abrasives is the practice of trying to save money by using the abrasives until they get too worn. When abrasives lose their cutting ability, they polish, and this will result in uneven staining. When sandpaper gets worn and no longer produces similar amounts of sanding dust as when new, replace it.

SWITCH IT UP

You may be able to reduce costs by switching to higher-solids coatings, which allow you to

get the same build with few applications. This is the argument, by the way, for water-based finishes, which have a higher solids content than many solvent-based finishes. Most manufacturers provide information about the solids content of their finishes.

KEEP IT CLEAN

Maintaining your equipment is critical for lowering costs. Dirty spray-booth filters, leakage in your air-handling equipment, and problems with your make-up air will increase your electric bill and may lead to do-overs that wouldn't otherwise be necessary.

Most important is to clean your spray guns after use or at the end of the day. This is especially the case when using water-based finishes. Lacquers and many catalyzed finishes can usually be cleaned adequately from spray guns by spraying solvent through them. The way you'll know if this works is to take the guns apart after the solvent spraying and check. But in my experience spraying solvent through the guns doesn't work well with water-based finishes. You have to disassemble the guns and clean all the parts individually. Then reassemble.

USE NO-WIPE STAINS

It's often suggested that you apply a washcoat before staining to reduce blotching. But this adds an extra step to the process. It's more efficient to spray a highly thinned stain and leave it without wiping. Stains sold for this process are called "no-wipe." The process itself is often called "spray-to-color". You are building the color slowly with thinned applications. Not thinning enough will lead to lap marks and reduced control.

The problem with the spray-to-color procedure is that grain isn't highlighted. The color appears flat. To correct this, apply a wiping stain either directly over the no-wipe stain or over a washcoat depending on whether the wiping stain will dissolve and smear the no-wipe stain. Then wipe off the excess wiping stain.

MONITOR THE CONDITIONS

It's important to always be aware of the temperature and humidity in the spray area. Cooler temperatures, especially after overnight in a cold shop, will lead to a thicker finish that will require more thinning or higher air pressure and more bounce-back to avoid orange peel, and maybe more coats. Higher humidity will lead to blushing in lacquers and slower drying in water-based finishes.

TEST ON SCRAP

To check that everything is working properly, it's always a good idea to spray a test sample before beginning. You can do this on scrap wood, or on cardboard or brown paper you roll down from a pipe hung from the ceiling. Brown paper is good because you can see problems easier than with white paper. Doing this test also allows you to adjust the settings and air pressure so you can reduce flaws.

WRITE IT DOWN

Especially if more than one person is doing the spraying, create a detailed and written standard operating procedure. With this, variations in quality and appearance can be reduced and hopefully eliminated.

ADD AUTOMATION

If you are in a large production shop, consider automating the finishing process. The initial cost will probably be substantial, but over time you'll save money on labor and do-overs. ■

7

COMPARING THE REFINISHER, RESTORER AND CONSERVATOR

BY BOB FLEXNER

About 20 years ago, at the turn of the 20th century, I was editing Professional Refinishing, a trade magazine that was mailed free to refinishing shops around the country. (Unfortunately, the magazine was dissolved in 2003 because there weren't enough possibilities for advertising to support it; by far, the primary cost in these shops is labor, not supplies.)

One of the trends I noticed among the readership was a tendency to inflate what they called themselves from "refinisher" to "restorer" and from "restorer" to "conservator." Conservator seemed to occupy the position at the top of the pack. So, what exactly is a conservator?

Before explaining this term, I want to point out that there are actually two large categories of conservator: one type is employed by museums; the other works in private practice for clients. It has its own sub-organization within the American Institute for Conservation of Historic & Artistic Works (AIC). This sub-group is called Conservators in Private Practice.

Though there is some crossover, of course, conservators in private practice work for clients – that is, they aren't employed directly by museums (or they are employed by museums and work for clients on the side).

So a conservator in private practice differs from a restorer primarily by the standards he or she keeps, or at least tries to keep. This is not always easy because in the end both conservators and restorers try to please their clients by giving them what they want.

BACKGROUND

The field of museum conservation has changed in the last century or two. This has occurred partly because of the improved conditions in museums, primarily temperature and humidity control, and partly because conservators have created standards to be followed with the goal of preserving the histo-

PHOTO: JOHN TROHA / REDUX PLUS

PHOTO: JOHN TROHA / REDUX PLUS

ry of the furniture, paintings, textiles, or whatever.

In the 19th and early 20th centuries, the curator (often called a "keeper") was in total charge of researching, acquiring and exhibiting the objects in the museum's collection. Sometimes, the curator felt accomplished enough to correct any damage to the objects. Other times, the objects were sent to someone who had the skills. Decisions for what to do were made by how easy the repairs were and by the appearance. "If it looks good, it is good" was the standard.

The problem was that this approach led to the removal of much of the history of the object. And as time went on, preserving the history rose in importance. This led to the establishment of AIC in 1972 with only a few members to begin with, but now totaling over 3500 worldwide. It also led to the eventual creation of a code of ethics. You can read this code at *www.culturalheritage.com*.

CONSERVATION

What this code did was make conservation professionals much more scientific in determining what should be done. They started paying attention to the chemical interaction between the original materials and the restoration materials being used. The techniques of microscopic examination and chemical analysis could be used on a cross-section of finish layers to determine what the original finish was.

With this information they could decide whether or not to try removing the added layers to get back to the original finish. This is commonly done by painting conservators, but there is a caveat. The original painting materials were usually oil paints, and later materials were most often shellac or some similar alcohol-soluble coating. This could be removed with alcohol without disturbing the original.

But the order in furniture was most commonly the opposite. The original was an alcohol soluble resin, and the added might be a varnish or even a catalyzed finish if done more recently. It's much more difficult to remove these coatings without also removing the original.

As you would expect with the increased emphasis on chemical analysis, there are now several universities in the U.S. and other countries that offer degrees in conservation. They usually begin with a knowledge of organic chemistry. The goal is to preserve as much of the history of the object as possible, along with long-term stability.

RESTORATION

There has always been a tension between the object as history and the object as functional. When the object will be preserved in a museum, the history can take priority. But when it is in the possession of individuals, the functional part usually takes priority. The owner usually wants to use the object and to love it for its beauty.

Some years ago, on several trips to New York and New England, I made an effort to visit many of the leading antique dealers. The one thing I found most striking was that almost all of the furniture had been fairly recently refinished. The old finish had been removed and a new one applied. As a refinisher myself, I recognized this immediately.

This was soon after the Antiques Roadshow had become a popular TV show on public television. The message of this show when it comes to furniture was clearly, "Don't refinish. You'll destroy the value." So I asked the owners of these galleries if this show wasn't causing them problems with sales. Quite to the contrary, each dealer explained, people in the market for this quality of antique furniture knew better. They wanted beautiful, functional objects, and keeping the "crusty craze" of original finishes didn't sell. So these dealers were simply responding to the marketplace.

Where the tension between preserving the history vs. making the object functional becomes evident is with conservators in private practice, working for individual people or businesses rather than museums. In my experience (and I have known many of these conservators), they often, or maybe I should say "usually," break with the code, because keeping to it wouldn't give their clients what they want.

For the longest time I struggled with this because I thought of all conservators as the same, and I knew so many who didn't follow the code very tightly. It wasn't until I realized that conservators working for individuals rather than in museums needed to be thought of differently. In many cases they are more like restorers than conservators working in museums. ■

8

COLORING OUR WORLD

The coatings industry is investigating new technologies, promoting next year's top colors, and emphasizing education

BY JOHN ENGLISH

One of the most interesting trends in the coatings industry is the way in which robotics and artificial intelligence (AI) are transforming traditional application technologies. Major coatings manufacturers are not only watching this evolution but are actively guiding it.

Take, for example, BASF Corp., headquartered in Florham Park, N.J., and the North American affiliate of BASF SE in Ludwigshafen, Germany. The company is collaborating with Citrine Informatics, a California-based materials data firm, to use AI to accelerate the development of new environmental catalyst technologies. Woodshops and other finishers are looking for cost-effective solutions to meet evolving emission regulations. The BASF initiative is focusing on identifying new materials for capturing greenhouse gases, such as carbon dioxide. BASF provides experimental data to build proprietary AI models using the Citrine platform. The aim is to improve the models through sequential learning by retraining the algorithms with new data.

"AI-driven materials development is the future of the materials industry," says Citrine CEO Greg Mulholland, "The companies who are first to invest in this technology will reap tremendous market rewards."

WARMER COLORS

In a more traditional look at trends, AkzoNobel has decided that Spiced Honey is the Color of the Year for 2019. The warm amber tone is being marketed under well-known decorative paints brands such as Dulux, Coral, Levis and Flexa.

"Our latest trend research," says creative director Heleen van Gent, "shows that people around the world are experiencing a renewed sense of energy, optimism and purpose. We want to reach out, engage with others and make things better. Spiced Honey reflects those desires."

Whether that will warm up the surfaces of paint and foil casework is to be seen, but paint trends often foreshadow door colors. AkzoNobel says that its color stylists use the Color of the Year information to offer on-trend color selections for product developers and designers in major markets such as furniture, cabinetry, flooring and building products.

The Sherwin-Williams 2019 color trends are "organic and spontaneous", and collectively feel like they reach more toward comfort and nature than the sleek metallic and starkness that we have seen in casework over the past few years. The company sees deep, mysterious blues, clays, caramels and browns, copper and gold that anchor merlot and gray, bold pops of vivid blue or green and red, plus botanicals from mushroom to passionate pink, and rich red to muted mauve. Together, they seem to suggest that kitchens and casework might be drifting toward a sort of pastel-infused, less European, warmer and more comforting pallet.

> "Coatings are also evolving in terms of dry time, durability and application use."

Staying in that vein, House Beautiful *(housebeautiful.com)* says that the Valspar division of Sherwin-Williams *(valsparpaint.com)* chose "a lovely mix of bright, almost-neon shades and soft-but-interesting neutrals to usher in 2019". Woodworkers can see them on the magazine's website.

Dulux Paints, a division of PPG, is taking a slightly different tack on color trends. The company has named two deep green tones as Colors of the Year for 2019. These are Night Watch, which is a deep green-black, and Mojito Shimmer, a glistening, frosted dark green. PPG brand manager Martin Tustin-

PHOTO: JOHN TROHA / REDUX PLUS

Fuchs says that "these colors represent the ultimate in luxe, delivering a rich, striking look that brings sophistication and depth to living spaces." Keep in mind that black and dark grey were hot last year, so he may be surprisingly prescient. However, cabinet shops will need to watch whether customers and their interior designers match these darker shades with similar or contrasting cabinet colors.

By the way, Old Masters *(myoldmasters.com)* has created an online tool for matching wood stains with room colors, and there's a project gallery on its site that can be quite handy when discussing stain with customers.

Worth noting about the relationship between casework stains and wall paints is a point made on the Family Handyman's website. There, the magazine suggests that woodworkers installing dark wood trim should keep adjacent paint colors light, because dark paint and trim together can make a room feel heavy and gloomy.

Architectural Digest suggests that high gloss hardwood floors are a thing of the past, and matte coatings are taking over. The publication points out that matte floors show fewer scratches and dings, so pets and soccer cleats won't leave such evident trails. However, it doesn't mention that matte coatings on high-use areas of cabinets such as the surfaces around handles and pulls may not hold up as well as a semi or even higher gloss, so the floor trend may not extend to casework as a practical solution.

Finishing trends aren't all about colors or sheen. Coatings are also evolving in terms of dry time, durability and application ease. For example, Axalta Coating Systems recently introduced new Amarium pre-catalyzed lacquers that offer clarity and enhanced UV protection. M.L. Campbell has developed its Polarion acrylic polyurethane line to include sealers, primers, and both clear and pigmented topcoats with a full range of sheens – all using just one catalyst and mix ratio.

INTERNATIONAL TRENDS

A professor at the University of Ljubljana in Slovenia is working on a method to use cold plasma (the kind used in wide screen television displays) to improve how wood coatings are hardened. Professor Marko Petric says that the research promises a process whereby a wood product's surface can be prepped, coated with lacquer and hardened in a single step. It's a bit like conventional UV curing, but should be less expensive and faster. Plasma curing also shows promise as a solution for damp conditions such as bathrooms and even outdoor applications.

Helsinki-based coatings manufacturer Teknos is one of the leaders in a trend that involves publishing Environmental Product Declarations (EPDs) for a range of its products. These measure a product's environmental impact, and include information on raw material acquisition, energy use and efficiency, raw material substances and chemicals used, plus the related emissions and waste for a specific product range. Architects and designers pay attention to these disclosures and use them as part of a total construction assessment of environmental impact.

Covestro AG, part of Bayer until a spin-off in 2015, is among the world's largest polymer companies. It, too, is part of a trend where coatings manufacturers are assuming environmental leadership. This September it was recognized as a LEAD company of the United Nations Global Compact, a global movement of responsible and sustainable corporate governance.

The bottom line here is that for several decades government regulations have changed the ways that we finish casework, but now global manufacturers are getting ahead of that curve and helping to create rules, rather than just follow them. That's a sign of maturity in the waterborne sector, where environmentally conscious products have gradually overcome the perception of both technical and financial barriers.

Woodshops in even the smallest of both European and North American markets are experiencing a shortage of qualified people to hire. One of the industry trends now is a willingness to move away from traditional education as a means of training potential employees, and a move toward supporting hands-on education sponsored by various machine, software and even coatings manufacturers.

For example, Morrells Wood Finishes, part of RPM International, is the U.K.'s leading supplier of wood finishes and coatings. One of the things that Morrells now offers is a free, two-day product and spray application course. It focuses on the correct selection and application of finishing systems for various wood substrates within different user industries such as furniture, shop fittings, caskets, flooring, joinery, kitchens, bathrooms and bedrooms. The course covers all modern lacquers including acid-catalyst, waterborne and polyurethane coatings, together with the latest types of finishing equipment and recommended application techniques. It includes practical demonstrations with full participation and interaction, and woodworkers can take the pieces of wood they have been working on back to the shop, as a reference guide.

Something similar is now being offered by several U.S. companies, but it's usually product rather than technique specific. For example, General Finishes *(genberalfinishes.com)* has created what it calls the GF University. The company posts a schedule of classes and events around the country, where various experts go on the road and teach woodworkers about the company's extensive line of water- and oil-based finishes.

With new educational choices opening up in the U.S. such as the Manufacturing Industry Learning Lab (MiLL) in Colorado Springs, Colo., and a general rise in the quality and number of two-year technical colleges, there is a trend in the industry toward separating the finishing booth from general shop tasks. With the concurrent rise in robotics and CAM spray applications, the trend in finishing seems to be to create a corps of specialists akin to the way that people operating wood processing machines such as saws and routers are being replaced by CNC operators. The required skills for coatings application are changing at least as fast as the chemical compounds.

Perhaps that is more of an evolution than a trend, but it's certainly where the industry is headed. ■

9

CONSUMER ADVOCACY GROUPS JOIN THE ATTACK ON STRIPPERS

BY BOB FLEXNER

In the March 2017 issue of Woodshop News, I wrote about the efforts of the EPA to eliminate paint and coatings removers that contain methylene chloride or n-methyl pyrrolidone (NMP) from the consumer market. I recounted how this effort had been going on for more than 25 years and is based on the unsubstantiated claims that exposure to methylene chloride can cause cancer and the fairly well substantiated claims that exposure to NMP can lead to reproductive problems in pregnant women.

This effort by the EPA continues, but in the meantime, there's been an interesting turn of events. Now it's consumer advocacy groups pressuring retail suppliers to stop selling these strippers. And these groups have apparently succeeded with Lowes, Home Depot and Sherwin-Williams. Each of these chains has announced that it is ceasing to sell these categories of strippers.

The reason given isn't that they cause cancer, but that a number of people have died while using methylene chloride strippers to strip bathtubs in a closed bathroom. The EPA estimates 40 deaths since 1975. The Center for Public Integrity estimates 56 deaths since 1980. By doing the math, this comes to between one and two deaths per year depending on which figures you use.

The cause that's usually given is the victim putting his or her head down into the bathtub while working. Methylene chloride fumes are heavier than air, so doing this increases exposure significantly over what might have built up in the room. Methylene chloride metabolizes to carbon monoxide in the blood, which replaces oxygen and can lead to a heart attack, especially in people who have heart problems.

You should never use a methylene chloride stripper (or any solvent, for that matter) without good air movement, in one door or window and out another, or outside.

Assuming these chain stores go through with their intentions, it will leave just one category of effective strippers available, those that are highly flammable.

A LITTLE HISTORY

It used to be that furniture stripping was done with flammable solvents or by scraping off the coating. The scraping was done with pieces of glass, not with the modern steel card scrapers we use today. The scraping couldn't help but also remove the top surface of the wood, which includes whatever color or marks that show the age and give the furniture much of its value.

In 1946 a fellow named William M. Barr invented a new paint stripper based on the non-flammable solvent, methylene chloride. It quickly took off in the marketplace because it was such a huge advance over the flammable solvents. This advance was probably the biggest ever made in paint strippers. At least, I can't think of others that are equivalent.

Methylene chloride is also an exempt VOC, so it is more environmentally friendly than the flammable solvents. But this was not an issue in 1946.

The success of this stripper led Barr to start a company that still exists today, WM Barr. The brand name you might associate most with this company is Klean-Strip.

BACK TO THE PRESENT

The consumer advocacy groups seem to be led by Safer Chemicals Healthy Families, which claims to be a coalition of 450 organizations comprising 11 million members. Other cooperating advocacy groups may include Resources Defense Council and Mind the Store.

Apparently, they wrote letters to the chain stores asking them to stop selling strippers containing methylene chloride or NMP and that was enough to be successful with these three big retail chains. I guess the chains reasoned that these strippers

weren't big enough profit makers to be willing to upset a large number of their customers.

Sherwin-Williams issued the following statement: "Our customers are our No. 1 priority at Sherwin-Williams, so we are eliminating methylene chloride paint strippers from our stores. We have several effective alternatives available to serve your project needs." Sherwin-Williams doesn't carry strippers based on NMP.

I would assume that Lowes and Home Depot would say something similar, but I haven't come across it.

MY COMMENT

First, these stores carry all sorts of dangerous stuff. I'll just point out one: ladders. Three hundred people a year are killed in falls from ladders and 164,000 go to emergency rooms. Remember that only one-and-a-half people die a year from acute exposure to methylene chloride. And though every life is valuable, these figures undercut the reasoning.

Second, I've been using strippers based on methylene chloride for over 40 years and those based on NMP for nearly 30 years, since they became available. I've used these in small quantities, more like an amateur would, not like a professional stripping and refinishing shop. I'm quite familiar with these strippers and their effectiveness.

If Sherwin-Williams were really making my needs its No. 1 priority, it would let me choose what to use, maybe with an instruction to not use for stripping bathtubs. (Some suppliers are actually doing that now.)

Contrary to its claim, there aren't any equivalent alternatives. As I've pointed out previously, all are either highly flammable, or they are weak and contain a lot of water. Leaving these strippers on the wood for a considerable time to give them the chance to soften the film causes harm, especially if stripping veneered surfaces.

Very old furniture and woodwork were typically finished with either shellac or lacquer, which don't require the strongest strippers to remove. But over the last several decades professional refinish shops have increasingly replaced these finishes with high-performance catalyzed lacquers and varnishes because of their increased durability. And this doesn't take into account newer furniture and woodwork finished with high-performance finishes, or paint.

So, when these coatings start deteriorating, as all do, and need to be replaced, the only available products that will remove them may be lye, (which is destructive to the wood and joints and dangerous to work with), flammable strippers, and sandpaper, which is destructive to patina and wood decoration, such as carvings, fretwork and turnings.

Concerning flammability, this is a real issue. I haven't found any statistics, but I have had direct experience. A number of years ago one of my furniture restoration clients hired a painter to strip the paint from the wood trim and paneling in several rooms of a very nice house.

After applying the flammable stripper to a section of one room, the painter flipped on a light switch, which sparked and started a fire that couldn't be extinguished before half the house had been destroyed.

Lastly, I want to mention that until the EPA acts further, methylene chloride and NMP strippers should continue to be available at independent paint stores. They are not likely to bow to the pressure from lobbying groups. ■

Bob Flexner is the author of "Understanding Wood Finishing" and "Wood Finishing 101."

10

NOT LOST IN TRANSLATION

Though British finishing terminology can differ significantly from our terminology, we're still speaking the same language

BY BOB FLEXNER

For the last 25 years or so I have been what's known as a freelance writer. Freelance means that I make my living by taking on various jobs wherever I can find them. I don't have just one job working for a company that provides me with a paycheck.

Explaining this makes me realize that I was actually a freelance woodworker before I became a freelance writer, even though I've never seen those two words put together before. I worked alone doing woodworking and restoration and took on all sorts of jobs to provide an income.

I have done the same as a writer. One of the most interesting and different jobs was some years ago working for a British publisher translating British woodworking and finishing books into American English.

You may have heard the expression: England and the U.S. are two countries separated by a common language. There are many examples of this. I'm sure you know that soccer here is football over there. Other examples include, an apartment here is a flat there. A cookie is a bisquit. Vacation is a holiday. And so on.

FINISHING

Well, the same language differences exist in woodworking and finishing. Specifically, when it comes to finishing, probably the most common are the terms having to do with French polishing. This is probably due to how much of the early instructions for performing this application technique were actually written by British French polishers. In fact, even the term French polishing is that way because the technique is thought to have been invented in France and then transmitted to the U.K. through Holland.

I remember reading some of these instructions in my early days. French polishing is, of course, a technique for rubbing shellac onto a surface using a balled up cloth. The solvent we were told to use was methylated spirits. So like many others who misunderstood this term, I dutifully went to the paint store and bought a can of methanol, that is, methyl alcohol, because that's what methylated sounded like to me.

But methylated spirits is ethyl alcohol (spirits – the stuff we drink) that has been made poisonous by the addition of some methanol. So methylated spirits is our denatured alcohol. Methanol works well, of course, but it is quite poisonous, and you shouldn't be standing over it for a long time breathing in the fumes.

Other French polishing terms adopted from the British include, rubber, which is British for pad (the shellac is rubbed onto the surface, so the pad becomes a rubber), wadding, which is cloth or batting, used to make the pad, and charge, as in charge the rubber, which means to add more thinned shellac, or load the pad.

Here are some more British finishing terms and how they translate into American English: Emulsion paint (latex paint); wire wool (steel wool); white spirit (mineral spirits); pencil brush (an artist's brush); mop (a round brush); liming (pickling), and atomizer (an airbrush).

Finally, I want to mention melamine, which has been sold here to woodturners. It is what we call, pre-catalyzed lacquer. The term, melamine, comes from one of the main resins used to make this finish.

Here's how I determined that melamine was pre-cat. A woodturner came by my shop one day with his container of melamine wanting to know what it was. First, I knew that melamine formaldehyde was a primary ingredient in catalyzed lacquer, so I had a head start.

But the way I tested was to apply some to a board. It dried very rapidly and it smelled like lacquer. So when dry I dabbed on some lacquer thinner. It didn't soften or remove the finish.

PHOTO: MICHAEL GORDON

The finish was resistant to lacquer thinner, so it couldn't be nitrocellulose lacquer. Also, it came in one part; there was no second part to add, so it couldn't be a post-catalyzed lacquer. It had to be pre-cat.

WOODWORKING

Most of the books I translated were woodworking books, and there are a lot of British terms having to do with various categories of woodworking. Subjects included Boxes, Children's Toys, Children's Furniture, Woodcarving, Bird Houses and a Complete Woodworking Course. You can get a feel for the market this publisher was targeting in the U.S.

The most common British term you might have come across is timber for a board or wood. Or cramps for clamps. A lot of the British terms sort of struck my funny bone. They made sense when I thought a little about the words used, but they caused me to smile. For example, a spanner is a wrench. Well, yeah, it spans the bolt or whatever. So it's a spanner. It makes more sense than a wrench.

Another similar example is a cross-head screwdriver. That's a Phillips screwdriver. Cross-head

makes total sense. As does impact adhesive (contact cement).

Here are some more: Nesting box (birdhouse); wheel brace (the brace in a brace and bit); pillar drill (a drill press); multi-ply (plywood), and scalpel (craft knife).

A few terms that I thought most Americans wouldn't understand I changed. But these terms have since become so common I would leave them now. Here are a few examples: DIY, for do-it-yourself; proud, as in leaving the pin proud. I translated it as protruding. Another is tin for can. I think most people would understand tin.

Anyway, it was an interesting experience. Freelancing, whether writing or in a shop can often be fun and challenging. In this case, the publisher would send me a manuscript by Fed Ex, along with a typical publisher plea to turn it around as fast as I could. I would mark it up and return it by Fed Ex. Now, of course, it would all be done online.

The British terms were not always obvious. Many times I had to use the context to figure out what was being referred to. If you happened to buy one of these books, I hope it all made sense to you. ■

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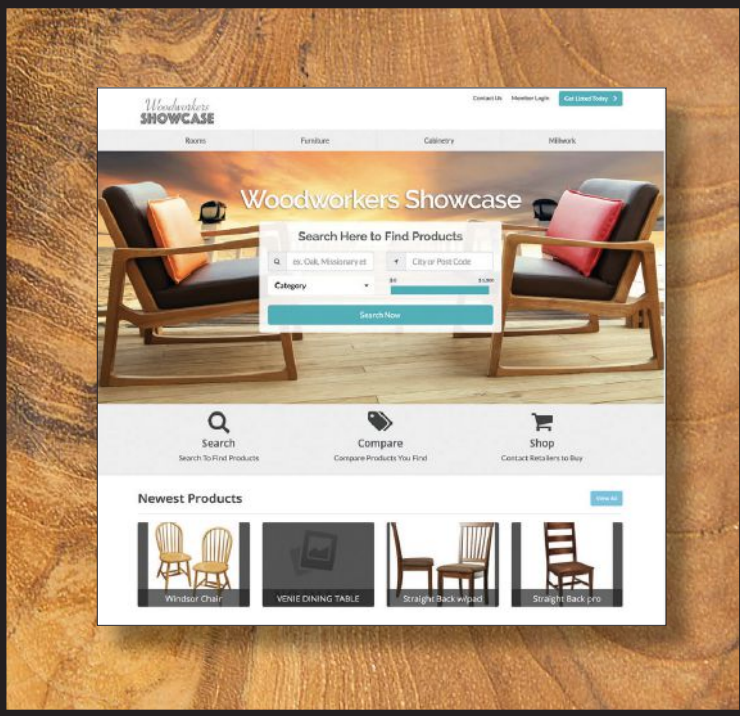

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