All the News that fits

Lake Charles Woodworkers Club, Inc. December 2016

John Griffith, President
Patrick LaPoint Treasurer

Officers and Directors

Barry Humphus, Editor, George Kuffel
Gary Rock, Steve Thomas, Joe Comeaux

Mentoring Program - If you have a project, a problem in any woodworking area, these members have volenteered to help. Give them a call. Jeff Cormier: 582-3278; George Kuffel: 478-2707; John Marcon: 478-0646; Gary Rock: 433-1679; Eltee Thibodeaux: 436-1997; Dick Trouth: 583-2683. Each have years of experience and knowledge.

November Meeting Highlights

The great folks at Stines hosted our meeting once again. As always, thank the checkout folks as you make a purchase.

Ray Kibodeaux started out our safety discussion. He purchased a SawStop table saw some months ago and instead of damaging something soft on his body, the SawStop worked as advertised. Ray showed off the firing mechanism after it had fired. While this ruined a blade (knocked off one tooth and could be repaired), it was a remarkable look at what this great saw can do and save.

We also had a review of Flock of Five store in Sulphur that provides a venue for your work. It is a consignment space where you can show off your work for a fee of $65 per month. Vets get their space for free and no commission is charged in either case.

It was mentioned that the Northern Tool and Equipment store is now open at the old Conns location on Hwy 14 near the intersection of 14 and E. Prien Lake. They are a competitor of Harbour Freight -- just across the street.

The Christmas meeting place was resolved by our LCWW Treasurer Patrick LaPoint, Minister of the Lake Charles Seafarer's Center. The meeting will take place there and we really look forward to joining others at this annual meeting. John Griffith asked for food contributions and a list was passed out for items that members may bring. Please contact John if possible to tell him what you may bring for the feast.

Show and Tell brought Bob Theau wih a great sign featuring the number 92 -- his just current age. Congrats Mr. Theaux. Camile Theaux (Bob's daughter and an old friend of Barry) was also here presenting a wood and metal sign she is building for a friend she called a Hummingbird Sign of Brad pear, cypress and spalted oak. Camile asked how she might carefully mount the wire letters and got several good suggestions.

Mr. Eltee Thibodeaux has constructed a nice drill bit organized using his CNC machine plus a home-made jig for a Kreg system all out of cedar.

John Griffith discussed the construction of a rostte for one of his guitar builds as well as the guitar arm using mahogany for the finger board.

Pie Sonnier brought one of his many candy machines. We don't know how many he has built over the years, but all of his children and grand-children should have one by now.

Patrick LaPoint did a picture frame from some of the unknown 'Port" wood he has acquired. Joe Comeaux brought us some beautiful tiger wood wine bottle stoppers of several designs some of which was from designer Ruth Niles who produces both stainless and brass kits for wine stoppers. Joe did cypress, ceadar, Brad pear, mesquite and spalted oak stoppers with a cool design for support. We hope that when he runs out of relatives, he could offer a few for donations.

J.W. Anderson had a pecky cypress box plus one from resawn birch and cherry. Sonny LeBleu had a scrowl sawn stand with bowl that is called a berry basket. I have one of these done many years ago and it is very cool. Steve Thomas brought a "cat and mouse" bowl with a lid of pecan, walnut and purple heart. Gary Rockhad a couple of lidded bowls with neat finials of elm, cherry plus a cool Christmas tree of pine and painted with great color and design.

The Christmas Meeting for the Lake Charles Woodworkers Club with be at the Lake Charles Seafairer's Center located at 150 Marine Street near the Port of Lake Charles. THIS MONTH it starts at 10 A.M. Please bring your Show and Tell items as well as the food you promised. 10:00 A.M.

Navigating the Sticky Stuff

A while back I looked at lubricants and their chemistry for your shop (June, 2016 issue), with an eye to the physics and chemistry behind lubrication. Talking about how to keep parts moving got me thinking about the other side of the equation – what's the science behind sticking stuff together? Home shops have a lot of applications for adhesives, so it probably pays to know how they work so you can choose the right glue for the job. I'll also take a look at a couple of broad classes of adhesives that are handy to have around the home shop.

So how do adhesives work? It turns out to be one of those "we've got some ideas, but nobody's really sure" things. The biggest clues come from looking at the chemical structure of adhesives, and as usual it's helpful to look to nature for first principles. From the mucilage or latex secreted by some plants to trap insects to the boiled connective tissues of horses sent to the proverbial glue factory, natural adhesives are all macromolecules of some sort. The long protein chains of hide glue, the polysaccharides secreted by plants and animals in need of a little stickiness, or even the hydrocarbon chains and terpene resins that early humans learned to gather from tar pits and pine trees to glue ax heads to hafts – all sticky stuff is composed of long molecules.

Whether natural or synthetic, polymer adhesives have a lot of sites to interact with each other and with the substrates they're sticking to. The degree to which these molecules stick to each other is called cohesiveness, while how they stick to something else is called adhesiveness.

Adhesiveness has a lot to do with molecules being attracted to each other thanks to van der Waals interactions, which is the total force between molecules based on their electrostatic charges and polarization moments. The forces are weak individually, but macromolecules offer lots of places for the force to act, contributing to both adhesive and cohesive properties. Additionally, macromolecules are good at penetrating into the pores of the substrate, contributing greatly to the adhesive properties by mechanically locking the adhesive to substrate.

Adhesives can be roughly organized into two broad categories based on how they cure. Non-reactive adhesives cure by non-chemical transformations, such as evaporation of a solvent or by cooling. Reactive adhesives undergo some sort of chemical change, generally polymerization, during the curing process. To be useful, both reactive and non-reactive adhesives need to be prevented from curing until they're applied. Non-reactive adhesives are pretty simple to manage – a sealed container to keep solvents from evaporating, or keeping a stick of hot glue at its melting point. Reactive adhesives can be a little harder to control, though, and might take measures as extreme as making the adhesive a two-part formulation that won't react until mixed, or keeping light-cured resins in the dark.

Now that you know a little about how adhesives work, let's look at a few glues that you might want to keep around the shop.

Those of a certain age will remember when "Krazy Glue" burst onto the mass-market scene in the early 70s with cheesy commercials about how a single drop was "strong enough to keep this man suspended in midair." Cyanoacrylate glues have come a long way since those days, and while results are not always equal to the hype, CA glues are a great tool to have around the shop. A reactive adhesive based on the rapid polymerization of methyl-2-cyanoacrylate, the polymerization reaction is catalyzed by water; even water vapor in the air will do it, which is why CA glues go off so fast once the tube is opened. Even a factory sealed tube is only good for about a year, so it's best to write the date of the package and rotate your stock. You can extend the life of a tube by keeping it in the freezer, though, since the polymerization reaction slows way down with decreased temperature.

CA glues are good for a lot of things, but not every material makes a good substrate. Very smooth surfaces such as glass are poor candidates for regular CA glues. Among the best substrates for CA glues are human tissues, with the skin on fingers and eyelids being particularly vulnerable. Acetone is your friend here, at least for the fingers; you'll want to get to a doctor for the eyelids. You'll also want to keep CA glues off of cotton and wool; the MSDS for some glues warn of a strongly exothermic reaction that can cause spontaneous combustion, but as it turns out, this usually doesn't happen. Still, better safe than combusted.

One neat trick is using CA glues as a filler by combining them with a powdered substrate. Baking soda is the classic example – the mixture forms a hard but workable material that fills gaps and cracks. Woodworkers also mix CA with fine sawdust to fill defects in veneers and fine furniture.

Not generally thought of as adhesives, threadlockers are nonetheless just that – adhesives engineered to glue metals together. Threadlockers are one-part reactive adhesives similar to CA, but generally based on monomers of methacrylate. The adhesive cures when exposed to the electrochemically active and oxygen-free environment deep inside the threads of fasteners. As it polymerizes, the

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Sticky continues . . .
threadlocker works into the gaps in and between the metals and increases the friction needed to loosen the connection. Threadlockers come in various strengths and with different formulations for filling wide gaps in worn threads or for wicking into preassembled fasteners. For less reactive metals like stainless steel, or for fasteners coated with cadmium or oxide compounds, a primer may be necessary to get the polymerization reaction started.

Everyone knows epoxy – it's the stuff that'll stick metal to metal or pot components for a waterproof application. Epoxides are three-atom rings with oxygen at the vertex. The bonds are highly strained, so epoxides are very reactive. Resins containing epoxides readily polymerize with themselves to form cross-linked structures with properties very similar to plastics. Most epoxies are two-part adhesives consisting of a resin and a hardener, most commonly available as a double-barrel syringe that mixes the two components in the correct proportion immediately prior to application.

Epoxy adhesives can be engineered to perform almost any job, and some are classified as structural adhesives that hold together things like buildings, boats, and airplanes. In electronics we see epoxies all the time, with epoxy resin and glass fibers being the main components of electronic circuit boards. For example I found an epoxy adhesive (at Stines) that is specific for abutilated styrene (ABS). I use ABS for 3D printing jobs at work and recently printed a couple of heel pads for shoes.

In fact, 3D printers often require a little adhesive assistance to get prints to stick to the bed. Advice abounds in online forums and around the local hackerspace as grizzled 3D-printing vets swear their method is the best and all others are inferior. A common suggestion is to use hard-hold hairspray, which after all is just an air-cured single-component aerosol-dispensed adhesive for hair. This works, but the method has its drawbacks and is not without a small risk of fire and flame. (nonetheless, it is my prefered light adhesive for 3D printing on heated build plates as it is quick and easy).

A safer alternative is plain old white glue or wood glue, which is poly-vinyl acetate (PVA) adhesive. PVA is a non-reactive adhesive that cures as the water in the solution evaporates. For 3D printing, a dilute solution of PVA brushed onto the heated bed of the printer will keep ABS and PLA prints stuck down until the bed cools, at which point they can be popped off.

Another glue that works well for this application and not nearly as messy is that wonderful glue that was invented by the 3M company – the glue stick.

Finally, no discussion of shop adhesives would be complete without the go-to glue of hackers and crafters alike – the hot glue gun. Great for temporary bonds, wire management, reinforcing connections, and general potting needs, hot glues are non-reactive thermoplastic adhesives that cure by cooling. Most glue sticks are composed of the copolymer ethylene-vinyl acetate (EVA) which cures quickly after being dispensed. Hot glue has some advantages over other non-reactive glues – for example, it doesn't change volume as it cures since it doesn't lose solvent to evaporation. It's not great for heat-sensitive substrates, of course, or for applications that are going to be subjected to high temperatures, but for a lot of simple jobs it works great.

By the way, hot melt glues come in a few varities for various purposes but most are either low-temp or high-temp. When purchasing these, make sure you get the correct type for your glue gun. Some versions from 3M are suitable for bonding wood such as their 3M Scotch Weld 3747 or 3789 versions.

Interestingly, one of the largest U.S. producers of EVA glue is local. Citgo Lubricants (formerly Cit-Con) right in Westlake. The company actually makes more money on the EVA than they do the lubricants as EVA is a by-product of lube production.

Annual Christmas Meeting

We have had the great fortune of having the past meetings at the shop of Larry and Leddy Cooper. But as they are winding down their place, we have a new opportunity this year. The location is the Lake Charles Seafarer's Center at 150 Marine Street in Lake Charles

LCWW Treasurer Patrick LaPoint is the Minister for the Center and has generously provided the facility for our December meeting.

At the November meeting, a list was passed around for you to sign up to bring something to eat beyound the meat (being arranged by former Treasurer Joe Comeaux).

Please contact John Griffith [griffith@mcneese.edu or call 513-8171] if you did not have an opportinuity to sign up to bring something with what you may bring to the meeting. Hope to see you there for food and conversation.

Annual Dues are Due

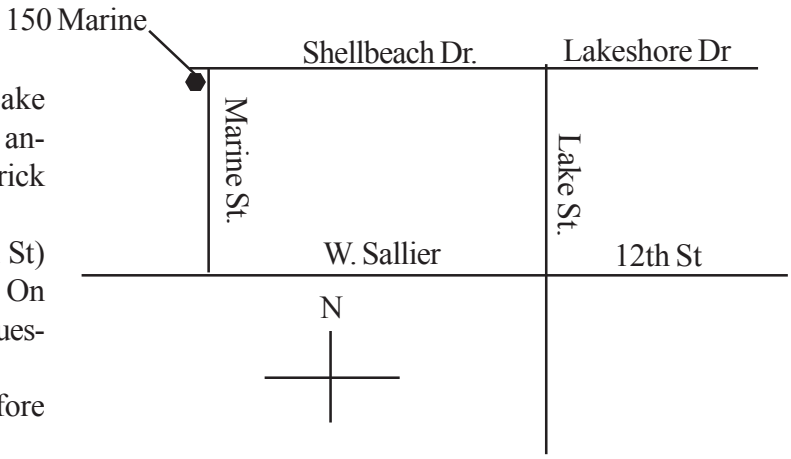
The Lake Charles Woodwookers operates on a very small budget and it is your annual dues that support this. December is the month that you need to pay so that we can continue this worthwhile endevor. Please pay $20 for a membership to Patrick LaPoint at the december meeting.

December Meeting Location

We have the wonderful opportunity to meet at the Lake Charles Seafarer's Center at 150 Marine Street for our annual holiday meeting curtosy of LCWW Treaturer Patrick LaPoint.

To get there go West on W. Sallier (aka 12th St) past Lake St. Turn right on Marine St. and go to the end. On your left at 150 Maine is the facility. If you should have questions, call Patrick.

Please take an opportunity to thank Patrick before you leave and ask about the facilitie's history.



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Lake Charles Woodworkers Club, Inc.
www.lcwoodworkers.com
1039 Timberlawn Dr.
Lake Charles, LA 70605