

Polymer Composites Incorporated

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Rod Ham's Project, A Lesson In Synergy

The following is an excerpt from correspondence that I had with Mr. Rod Ham who contacted me and inquired about the use of our MAX CLR-HP-HP for a project he had in mind.

He wanted to make a table top that involved embedding several dozen brass bullet cartridges' onto a recessed tabletop, a unique tabletop project. I was impressed with his idea and from that brief exchange of ideas; we began a collaborative endeavor to create what turned out to be a very impressive and unique art piece.

The tabletop was made from several wood species which he skillfully designed and fabricated with impressive craftsmanship. Rod noted from the beginning that he had very little experience using epoxy resins or the whole process of embedding which is where my involvement began.

We spent some time corresponding through email and after several design discussion and process modification he finally began the tabletop and embedding project late 2007.

The following is the step-by-step procedure which he diligently followed. After several days of more discussions, he finally sent me an email that he completed that tabletop along with the following photographs. Very impressive, don't you think?



Video Demonstration:

https://youtu.be/Nm_LG4o4pIE

I am posting this bulletin, with Mr. Ham's permission, as a great example of several collaborative relationships that I have had the pleasure of participating in our eBay venture. I hope this document finds its way to other artisans that would find value in content.

Gerald Lapuz
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From: Rod H.
To: Gerald L.
August 14, 2007

Hi Gerald – Assume you got my pictures – I will call you tomorrow or Friday. Would you look over the following steps I will take and make sure these look OK to you.

1. 1 cup resin, ½ cup agent. I will apply around each cartridge and place the cartridge in its hole. I also need to wipe mix on top of each cartridge as well as spreading it around the edge of the table to seal where the wood meets the glued metal edge. I will use a small paint brush to apply the mixed resin per discussion.
2. Wait 4 hrs, then 2 cups resin, 1 cup agent, ½ cup acetone. I will use a paint brush and “paint” the entire surface including cartridges and extended metal edge.
3. Cure for 24 hrs, then sand loose fibers where necessary (with 280 grit paper), wipe down w/acetone, then use 1 quart of mixed resin and pour onto top starting from the middle of table – let the mix find its own level.
4. Wait 4 hrs., then give top quick acetone spray – squirt upwards.
5. Let it cure for 24 hrs, and then apply final pour – 1 quart mix – careful not to overflow metal sides.

How does it look to you, is the 24 hr wait between steps 5 & 6 the right length of time?
I really appreciate all your help
Rod

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From: Gerald L.
To: Rod H.
August 15, 2007

Hello Rod,

My pleasure Rod....I got the pictures fine, and I was impressed with the woodwork you did. Anyways, you might want to reverse step 1 and 2 in your note, you will see why as I list the procedure; I am going to be very specific about the process as I want this project to turn out well as much as you do, so pardon the long note. So sit back with a cold one and read on.

Here is what I propose:

Place the Epoxy and Curing agent in the same room as all that you will use and allow it to acclimate to the same temperature. A good temperature to work at is around 75 to 80 degrees.

As far as the dam or borders around the wood, a good trick is to apply painters blue tape over it so if do spill over it is protected.

Chapter 1: Sealing the wood base

- In a clean container (plastic please since we are going to add a solvent), measure out 1 cup of Resin or Part A and 1/2 cup of Curing Agent and mix for 1 to 2 minutes.
- To this add 2 tablespoons of acetone to the mixture (still in the plastic container) and mix for another minute. So your formulation will be:

Component	Parts by Volume
MAX CLR-HP Part A or Resin= 1 cup	50 parts
MAX CLR-HP Part B or Curing Agent = 1/2 cup	25 parts
Acetone = 2 tablespoons	3 parts

1 cup is 16 ounce or one pint so 32-ounce for two cups should be enough for initial sealing of the wood. In essence, you are making a 3% diluted mixture, and this will be very low in viscosity.

- Transfer the entire contents into another container and mix for another minute or so. This will ensure that everything is well mixed and homogenized and guarantee no tacky spots. Make sure the room is ventilated and extinguish any ignition source as acetone as you know is flammable.
- Use a fine bristle brush (tug on the bristle first to remove any loose bristles, nothing more frustrating than finding them later when everything is cured) and coat the bare wood. The first application will really penetrate the wood as the wood will act like a sponge and really absorb the coating. This will also make any loose wood grain rise and stand up. This is called "grain raise" and the first coat is intended to lock these wood fiber ends into place, sand it smooth and apply the embedding resin.
- Wait about five to ten minutes to allow the acetone to evaporate, so it does not get entrapped when the second coat is applied. Again, good cross ventilation will help speed the evaporation process and reduce flammable vapors from concentrating.
- I would do at least a coat on the back side as well; this way there will less stress on the wood as the resin cures. This will also ensure that the wood will not absorb any moisture that may cause it to warp ten years from now. This will also make it virtually waterproof.

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- Apply the second coat as evenly as possible and make sure that you do not over saturate the holes and allow the resin to pool. You just want to seal the bare wood as far as the holes are concerned. Clean your brush and container using the acetone if it is not one of those throwaway brushes.
- Allow the coating to cure for 24 hours. This cure time is again important so that all of the acetone will evaporate so the longer, the better. The MAX CLR-HP does not contain any silicone surfactant that can contaminate, and subsequent coats and the epoxy to epoxy bond will be very strong. I had you coat the holes first to further reduce the chance of any air bubbles from developing. The epoxy to epoxy bond will be much stronger than epoxy to wood bond as well.
- Sand the wood using a ScotchBrite pad or 280-grit or finer sandpaper just enough so that all the gloss is gone from the surface. You do not want to sand off the coating as this will defeat the purpose of the pre-coating.
- With a lint free rag or an old cotton t-shirt rag, dampened with acetone, wipe the surface until all dust is removed. Do not use compressed air from a compressor as sometimes it will be contaminated with compressor oil and this will cause fish-eyes and orange peeling. Just wipe the entire surface several times with acetone/rag, and it will be fine.

Chapter 2: Preparing the embeds and bonding the cartridges

Now you are ready to bond the cartridges to the wood base, but before you do that, clean the cartridges with the acetone/rag and allow it to dry. One nice thing about the MAX CLR-HP is that it is low in its corrosive index unlike other types of curing agent that are very reactive and can tarnish metals such as the brass cartridges. As a general fact, epoxy resins are excellent anti-corrosion coatings and are an industry standard for such applications.

- Mix enough of the MAX CLR-HP in the same mix technique as before but omit the use of the acetone. You may want to try filling the holes with a bit of the mixed resin and then insert the cartridge. I think this will be a better way to ensure a complete seal. You can then take the brush and paint around and over the cartridges. Make sure to coat where the primer is seated on the cartridges. I use to do a lot of reloading, and there was this red coating that I used to paint over the primer to guarantee that it was waterproof. The goal here is the other way around; to guarantee a seal, so no air bubbles escape around the primer seat during the application of the embedding or thick coating.
- Do not worry about the overflow around the holes as they will be transparent when the first pour is applied. When all of them are in place, take your acetone spray bottle and mist up and allow the acetone to rain down on the overflow coating to pop any bubbles. Allow it to SET for about 4 hours.
- Note that there may be some mixed resin that is going to be left over in the container, and if you did your mixing correctly, it would cure to an excellent tack free puck that you can easily pop off the container.

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Chapter 3: Applying the first coat

As we discussed before, the plan is to do the embedding process in at least two pours if not three pours. The idea again is not build-up too much heat so that the resin will stay as clear as possible and not prematurely yellow due to the heat it will produce if the embedding gets too thick.

- Calculate the amount of resin you will need as noted in the bulletin that you downloaded. If you need help doing so just give me a call, and I will be more than happy to do it with you.
- Place the wood base in a dust free area and level it water level as accurately as you can. Also, make sure that the wood base should not be move until the whole process is complete.
- Repeat the mixing process as before, again no acetone, and when it is fully mixed pour it in the center only and allow the resin to flow and seek a water level state. You can use a brush or spatula to coax the resin a bit. The self-leveling will take about 5 to 10 minutes and this time will also allow any mixed air bubbles to come to the surface.
- Most of them will pop by itself but to ensure you get all of them, do the acetone spray technique. A small penlight helps in finding those pesky bubbles so dispatch them either by poking it or with the acetone spray but use the acetone sparingly and always mist up and not spray directly onto the coating.
- By now you should get a feel for how long the resin takes to set dry to the touch (about 3 to 4 hours) so just keep repeating it until the cartridges are completely embedded. Keep a close eye for air borne dust and flying insects. I can't tell you how many times debris landed on my coating project and ended up applying another coat.
- Allow the final pour to cure for 24 hours or longer if you are a patient man... , if you can, now is a good time to take out the blue tape that protected the metal border, but if did not spill any then just leave it until it cures. It is much easier to clean up any spills while the resin is still wet, so just a thought.

Chapter 4: Polishing.

- The resin will be nice and hard and glossy in 24 hours and you can handle it by then. But, it will take up to seven days to fully cure the resin at room temperature, 97% of the curing though will occur in the first 36 hours.
- Do not place anything heavy or hot on top of the coating for at least seven days as this will leave an indentation that will be permanent.
- You can further improve the gloss and scratch resistance by polishing the surface after 36 hours. Use an automotive rubbing compound and then a good quality wax and give it a good buffing.

Instructional Video Playlist Can be Viewed At our YouTube Channel
https://youtu.be/Q2HCTIfqIxU?list=PL6x6YfnNMffxolgQwS_-iD90vB3yBlmZ1

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And you are done!

I think I covered all the bases, just call, and I will be more than happy to help and if I missed anything that you feel be a point of concern. And, if you don't mind the pictures during the process, it would be much appreciated on this end.

Thanks again.

Regards,
Gerald