

Plexitone Finish

Plexitone Finish Overview: It's funny how old things have a tendency to become new again... One of the old finishes from many years ago has recently been chatted up on some of the woodturning message boards as the latest new pen finish – the Plexiglass/Acetone finish, or as I call it the "Plexitone" finish. "Plexiglass" is the trade name for a type of acrylic plastic known as Polymethyl Methacrylate.



All you need to make this finish is plexiglass, acetone and a glass jar.

This finish is made by taking scrap plexiglass (not polycarbonate) and cutting it into small squares that will fit inside a glass jar, or metal can. The plexiglass pieces are added until the container is about one-third full. Acetone is then added until its one inch over the top of the plexiglass. In a few days, the Acetone will dissolve the plexiglass. What you're left with is a thick plexitone master solution that can be used for finishing.

Back in the Day

Many years ago (more than I will admit here), when I was about eight years old, we used a similar homemade finish on model planes and rockets. Back in the day, we always called it "Finishing Plastic" and we used it to finish the exterior of model planes and rockets. It worked ok as a finish, but it was a real pain to work with most of the time. The biggest problem back then was getting the right application viscosity. Too much Acetone and the finish was too thin, too little and it ended up the consistency of peanut butter.

We were easy to please back then, after all we were just kids looking for a better finish for our model planes and rockets. The quality of the finish was not too important, since the models were usually in a million pieces in short order anyway. My toys never seemed to last very long... One

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beautiful summer day I shot off one of my prize model rockets that I had been working on for several weeks.



The master solution is crystal clear.

The rocket was gleaming from the plexitone finish, as I carefully loaded it onto the launch platform. When I touched that bad boy off, it flew like a bullet straight up and away never to be seen again. The parachute failed to deploy and after an extensive search, my rocket was never found. Bummer! You can bet it was one sweet ride for the plastic army man inside!

Fast Forward To Today

Many turners have begun experimenting with this finish on their pens and have reported good success. Just as many say it's too much trouble and have decided to not use it anymore. If you turn pens, you know that as pen turners, we are always searching for a "perfect" pen finish. I'm not sure it will ever be found but no matter, the search for the perfect pen finish is alive and well. Plexitone is far from a "perfect" finish, but when you get it right, it can come very, very close.

Making the Master Solution

If you would like to give this finish a go, you'll need to make up a master solution. The master solution is a concentrated solution that is used as a base for thinner finishes. The master solution should be quite thick (like molasses); since you will be using to prepare many different finishes from a thick dipping finish all the way down to a water thin penetrating finish.



The master solution is usually as thick as molasses.

To make your master solution, buy a clean quart metal paint can for your local hardware store, or use a large glass jar with a tight fitting lid. The lid must fit tight on your storage container, or the Acetone will evaporate and your plexitone will return to a hard plastic state. Take some scrap plexiglass (check local stores that sell plexiglass, you might be able to get some scrap for free) and cut it on the bandsaw into small squares. I usually cut 1.5" squares for quart containers and 2" squares for gallon containers.

You want to cut enough plexiglass to fill the lower 1/4 to 1/3 of the can with the cut pieces. Layer these into a **clean** container and then add enough Acetone to cover the plexiglass with about one inch of Acetone. It takes several days for the Acetone to dissolve the plexiglass. You can speed this up a bit by stirring the plexitone every few days, but I prefer to just let it dissolve on its own.

The exact ratios are not critical, since you will be thinning your master solution before you use it anyway. After a few days, your plexiglass squares will have dissolved and you will have a uniformly thick solution of plexitone. Every so often, you will need to add some more Acetone to your master solution to keep it from becoming too thick. I top mine off a bit as needed, maybe once every two weeks or so...

If the master solution gets too thick, simply add more Acetone and wait a few days. It will re-dissolve the plexiglass and renew your solution. Keep your master solution tightly covered and as clean as possible.

Adjusting for Specific Viscosities

Your master solution is too thick to use as is, so you will need to thin a small amount each time you want to use it on one of your turning projects. Small ceramic cooking dishes (ramekins) work great for mixing the master solution and are large enough to hold a sufficient amount of finish for

almost any small project. Do not use ramekins from your kitchen cupboard. You can buy a few ramekins to use in your studio at any cooking store for a few bucks. They work great for mixing small amounts of stain, dye, or finishes and are easy to clean.



Ramekins make great mixing containers for thinning plexitone.

To remove the master solution from its container, I use a clean wooden tongue depressor (like the kind your doctor uses to see the back of your throat) to scoop out a small "glob" of the master solution. Tongue depressors are cheap enough to throw away after each use and require no clean up. Clean Popsicle sticks can also work in a pinch.



Tongue depressors are used for removing the master solution.

After you have removed the desired quantity of plexitone from your master container, immediately close the lid. This will keep dust and debris out of the container and make the Acetone last longer. If your master solution becomes contaminated, you will have to make up another batch. Use Acetone to thin the master solution to an acceptable application viscosity.

There is no hard and fast rule for thinning, since the master solution viscosity varies from user to user. I usually make three different finishes, a water thin grade (used for stabilizing wood), another grade that's about

the viscosity of real Maple syrup and a thicker grade that's similar in viscosity to Molasses. Play around with the amount of Acetone and experiment a bit. This is not an easy finish to work with, so be prepared to test it on scrap wood until you can develop your own protocols and formulas.

Caveats with Plexitone

Plexitone can be a real bear to get the viscosity correct, but it can also produce a very durable finish when you get it right. Most of the emails I receive about problems with plexitone can be eliminated with careful finishing and surface preparation protocols. As I mentioned earlier, this is not a quick or easy finish.

There are many possible causes for plexitone finish failures. It does not care for getting hot when sanded, so you need to keep a light hand if dry sanding. Allow some free spin time in between grit changes, or shoot the surface with some compressed air between each grit change. To better eliminate heat during sanding, use wet sanding abrasives like Micromesh. Plexitone responds beautifully, if not magically when wet sanded -- just like other plastics.

This finish demands a good surface bond when applied. This means that oily timbers must be washed with Acetone before applying the plexitone to remove any surface oils. Other solvents can also be used to wash the surface, but I prefer using Acetone since that's the thinner used in the finish. My old junior high school woodshop teacher would call that "Finish Harmony." He always said to keep the wash down solvent and the finish solvent the same, a lesson well learned.

Plexitone will make any surface defects look like the Grand Canyon. Just like any other high luster finish, plexitone acts like a super powered magnifying glass and will make sanding scratches, torn grain and similar defects look 100 times worse than they appear on the bare wood. If you spot any sanding scratches, re-sand as necessary. When you've completed your last grit, do a final hand sanding in-line with the grain (if a wooden blank), to insure there are no circular scratches remaining.

You must also remove any residual sanding dust on the surface of your project before applying your plexitone finish. Residual sanding dust left on the surface will make your plexitone finish look like you've rolled it on the floor, if not worse. Use compressed air to remove as much of the sanding dust as possible, follow this with a solvent wash to eliminate any residual dust left in the pores of the wood.

Getting the plexitone finish just right can be tricky. If the viscosity is too thick, the finish never really bonds well to the surface. To combat potential adhesion problems apply a water thin layer of plexitone to act as a sealer first, let that dry and then cut it back lightly with fine abrasives before applying the base finish. For course-grained timber, sealing is not usually necessary. Fine-grained species usually benefit from a sealer coat to improve the base coats adhesion, depending on the specific application viscosity used.

We all know there are no magic finishes that go on in the blink of an eye

and last forever. If you want speed, you usually sacrifice durability. If you want durability, you usually sacrifice speed. There is no easy answer to a highly lustrous and durable finish. If you want one, you have to be prepared to spend the time to build the finish and then finish the finish. There are no shortcuts to awe inspiring finishes!

Plexitone - Dipping Finish

My favourite way to use plexitone is as a dipping finish. This requires a thick viscosity, something close to really thin Maple syrup. I typically use this to finish inlays or small projects like bookmarks, keychain inlays and similar mandrel turned projects. I've also used it as the primary finish on a pen. The ends of the pen tube must be plugged and you have to rig a dripping rack of some sort to catch the excess finish as it drips off the barrels.

You also need to re-square up the ends of the tubes with your pen mill, or sand them lightly to remove any excess finish on the ends of the barrels. This creates a finish that looks like it's three feet deep when taken to 12,000-grit with Micromesh. It's quite a bit more work than using the thinner plexitone finish, so I reserve it for up-market items where I know I can recover my additional labor costs.

The viscosity has to be just right with a dipping finish, or it can leave too much on the barrel causing *lippage* (a condition evidenced by barrels that are oversize at the mating surface on assembled components, creating a small lip that can be felt with your finger), when assembling your pen components to the barrel.

Too thick a finish can also create adhesion problems, so if you want to experiment with thick plexitone finishes, make sure you pre-seal the surface with a water thin layer of plexitone first. Thick plexitone finishes are the hardest to work with, so be prepared to experiment a wee bit on scrap wood before attempting to use it on a valuable project.

Safety Notes

Be sure to wear any protective equipment that may be required to protect your skin, face, eyes and lungs. Mixing your own finishes requires a high level of discipline and commitment to wearing all necessary protective equipment. Chemical resistant gloves, face shield and a respirator (a dust mask will not do anything for fumes) outfitted with the appropriate organic vapor cartridge, must be worn if you're going to be making your own finishes. I also wear chemical resistant slip-on arm covers and a chemical resistant apron to protect against splashes when mixing finishes.



Some of the 4H chemical resistant safety gear I wear when mixing finishes: slip-on arm covers (upper); gloves (lower left); apron (lower right).

Final Thoughts on the Plexitone Finish

If you're willing to put in the work, this can be a great finish for you. It's not easy to work with and getting the viscosity just right is a challenge at times, but the results can be spectacular. If you're just getting started with pens, I would skip this finish altogether and work on mastering a shellac friction finish, a spray lacquer, or a Cyanoacrylate finish. If you've been turning a while and you're looking for a new finishing challenge, look at plexitone. It just may turn out to be your next new (but really, really old) "miracle" pen finish.

Safety Note: Always follow all manufacturers safety instructions before working with your lathe, or any of the tools or products you may use. If you are unsure about any operation, obtain competent professional instruction before proceeding. Use and wear all necessary safety devices during turning and observe safe woodturning practices to prevent accident or injury.



Steven D. Russell is a professional studio woodturner, teacher and writer. He has written numerous articles for international woodturning magazines, which have been published in more than 78 countries around the world. Steve has demonstrated in numerous cities across the United States. His studio, Eurowood Werks, specializes in bowls, platters and hollow forms with unique visual and tactile treatments.

Steve is also a regular featured writer for the Guild of Master Craftsman's "Woodturning" magazine, published in London England. Woodturning magazine is the world's leading magazine for woodturners. Look for his monthly articles covering technical topics, or project based articles in each issue.

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