



# 10 STEPS to a better Ca finish

This month, **Kurt Hertzog** looks at using cyanoacrylate to finish work

PHOTOGRAPHS BY KURT HERTZOG

## KURT HERTZOG



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As a woodturner, we are usually in the mode of instant gratification. Mount the blank, turn, sand, finish, dismount and use or sell it. This is usually in one session at the lathe. Most of us are unlike woodworkers who usually spend far more time on their projects. In the search for fast and durable finishes, I've only been satisfied with two. One is spray lacquer. Not the fastest but reasonably quick, good looking and durable. We'll cover that finish some time in the future. The fastest, most durable finish I know of is a Ca finish.

Cyanoacrylate adhesive makes a wonderful finish for wood. There are many methods for

application as a finish. Some methods I agree with, others I don't. For the most part, Ca finishes have been relegated to small items such as pens, but with proper technique, it can be used on much larger items. The method explained here will allow you to use Ca finishes on bigger turnings. If you have a method that works for you and are satisfied, continue with it. Please don't construe my methods as the right or the only way. What I'll explain works for me and I'm sure it will work for you. If you are in need of something better than what you currently have, give my suggested method a try. After trying, you'll be able to make a value judgment to continue with it, adapt it, return to your old, or continue your search.

## Safety

Cyanoacrylate adhesive gives off fumes that some people find offensive. Plenty of ventilation is recommended. There are vendors offering 'odorless' versions of Ca but I haven't found the need to use them. I can't offer information on their odorlessness effectiveness or the working characteristics of those versions. Depending on your sensitivity and the amount of Ca being used, you can certainly use a filtering mask. An activated charcoal filter mask may alleviate any difficulties you encounter with Ca fumes. The Ca curing process or more accurately, crosslinking, gives off heat. This can be very hot! Take care when performing a Ca finish



Eye and face protection should include safety glasses and faceshield. Gloves and positive airflow helmet can help

to avoid being burned. Do not dispose of any application rags until they have completely cured and cooled. A common problem faced by those careless with Ca adhesive is becoming attached to their equipment or themselves. Ca adhesive cares not what it bonds together. You can easily attach your fingers together or your hand to your lathe. The debonding chemicals are effective but also require care in handling, use, and storage. Read and heed the manufacturers instructions for your safety. Ventilation and eye and face protection is always in order at minimum. Regardless of the finishes you use, Ca, lacquer, rub and buff, or other, be aware of the food safety concerns. Unless the finish has been tested per your local regulations and certified as 'food safe', use your finishes as decorative finishes only.



## Preparation is everything

In our rush towards completion, the preparation for finish is usually where woodturners scrimp. Regardless of the finish you are applying, your final look will never be any better than the workmanship underneath. Any dust, oils, or other contaminants will hinder your finish. Scratches or other flaws will not be hidden. They will be amplified with any see through finish. Woodworkers will spend on average a third of their project time on building the project. Another third is spent prepping for the finish. The last third is spent applying and 'finishing' the finish, i.e. rubbing it out, buffing, or other final touches. I don't intend to tell you to spend one third of your time sanding and prepping for finish but I do recommend you spend sufficient time to remove all of the scratches, debris, and contaminants that will show up underneath or hinder the proper application of your finish. Sand through the grits. Use the intermediate grits as needed. Don't be afraid to continue on with MicroMesh abrasives if appropriate. MicroMesh abrasives work very nicely on dense woods. In normal situations, getting to 400 or 600 grit abrasive will be adequate. Remove the dust and particles between each grit. You shouldn't need to degrease if you've been careful with your waxes and oil through the process of turning and sanding. I always use a complete wipe with a paper towel with denatured alcohol to clean up all of the dust and any finger oils just prior to applying finish. Depending on your location, nearly any of the petroleum distillates will work.

## Master the process in the practice area

Learning to apply a Ca finish isn't difficult. That said, you'll certainly improve your results with practice. Don't do your learning on a valuable turning. Take some scrap pieces and prepare them as you would to apply your finish. Learn and master the techniques on those less valuable pieces. Turn just the outside of a bowl. Finish that. If you wish, continue with the inside next by hollowing, sanding, and finishing. Your practice will pay off and your success percentage will increase. If someone tells you they are always 100% successful, I'd beware of anything else they said. Over the years I've become pretty proficient but on occasion there is a less than ideal application. When that happens, I need to go back to the sanding and prep to apply again.

## Have the correct materials minus the voodoo

When I apply a Ca adhesive as a finish, I use only thin viscosity. There are those who will profess that medium is the answer and



It is good practice to clean the final surface prior to finish application. Here a practice piece is wiped down with denatured alcohol



As with any skill, practice helps mastery. Take a scrap piece of material and prep as you would a 'real' piece and practice

often will dictate the brand of Ca. Some of the more vocal will even insist that the brand of paper towel impacts your success. Not to offend those folks but I've found that fresh thin Ca from any manufacturer, applied correctly to a properly prepared surface, will be successful regardless of the maker of the paper towel used for application. I suggest you use your favorite Ca adhesive and any roll of decent quality paper towels. The glue should be fresh meaning that it hasn't sat around so long that it begins to change viscosity. You'd like it to be like water. I won't quote the viscosity values in centipoise (cP) but if you look at various spec sheets it will have a wide range and still be called thin Ca. Water has a cP of 1 so get lower value rather than higher if you have a choice. That said, I've never run into a non-time degraded thin Ca that I couldn't get to work. Skip the boiled linseed oil adulteration of the adhesive. For those who use the boiled linseed oil/Ca technique and are happy with it, by all means continue. Those who haven't



Not intended to offend those who believe but I find combining with BLO or needing a specific brand of towel just bunk



Just a few of the brands of Krazy, super glue or cyanoacrylate adhesive that you can use for a Ca finish. Find one and stick with it

started, I recommend skipping the addition of boiled linseed oil to the Ca as you apply it. The chemical wizards that I've checked with say it adds no value to the process from their perspective. It adds cost and complexity for little or no apparent gain. You'll also be using Ca accelerator. The version using acetone as the carrier is preferred but not critical.

## Use proper PPE

As noted in the safety section, be certain you have sufficient ventilation so the Ca fumes don't cause you problems. The moisture of your eyes and nasal cavities will be affected. Once you've gotten proficient applying Ca finishes, you may wish to skip some of the hand protection but it is your choice at that point. For starters, I recommend using gloves as hand protection to prevent you becoming stuck to things. As you apply the finish, too much glue or poor application technique can get you bonded to your work, your lathe, your clothes, or yourself. With disposable gloves or the equivalent, you can simply peel off the glove and extract yourself. Gloves, especially the thicker nitrile, help protect from the heat a bit.

## Be prepared for problems

Whether you work barehanded or with gloves, it is wise to have the Ca release chemical at hand. You can buy the Ca release chemical from your local woodturning supplier in small quantities. The active



Regardless of your proficiency with Ca adhesive, you'll do well to keep acetone nearby and open for one handed use

chemical ingredient to effect a separation of your skin from the lathe is acetone. If you wish to buy acetone in larger and far more economical pricing, nail polish remover is usually 100% or very high concentrations of acetone. You can also buy acetone from your local home supply retailer in larger industrial sizes. To separate things that have been bonded together with Ca adhesive, soak the interface generously with acetone and wait. Slowly try to work the pieces apart repeating the soaking process. Patience is a virtue to leave with all of your skin. Have your acetone source nearby and open. Should you get bonded to your lathe, your can of acetone on the shelf across the shop will not be convenient. Nor will opening it one handed. I use an old Ca bottle that was cleaned well with acetone as my dispenser bottle. I open it and have within easy reach whenever I am working with Ca adhesive. Always label any transfer container with the contents.



Ca finishes go quickly. Get all in readiness before you start. Looking for the debonder once you are stuck isn't funny

## Don't begin until all is ready

The temptation to hurry and put on a finish is great. I recommend that you don't begin until all is ready and in place. The work to be finished whether one piece or many should be sanded and cleaned to the best of your ability. Your selected Ca adhesive should be fresh and in sufficient quantity to complete your task at hand. Running to the store to buy more or even going to your supply cabinet and opening a new bottle is disruptive. When you get going, you want to work to completion without interruption. Have your PPE at hand including extra gloves, towels, and accelerator. Don't forget to have your Ca release agent open and at hand. A small dispenser of acetone will work nicely. Dragging your 900 pound lathe across the shop to get to the acetone ruins your day.

## The application process

The technique that I used for many years has been altered recently to a more versatile method I learned from Alan Trout. Alan has been sharing a technique he developed for some time. His has the advantage of working on any sized work. Once all is ready having sanded, wiped clean, and ready to apply the finish, here is the process. Take a paper towel and fold it enough times so you have a multiple layered pad of about 50 by 75mm. If you have the half sheet perforated paper towel variety, folding that half sheet into four quarters works well. The multiple layers will provide sufficient thickness to wet the towel with enough accelerator and protect from wicking through to your hand. Using the lathe to hold and rotate the work, set the speed at a low rpm. Somewhere between 250 and 600, depending on the size of the work. Apply a quantity of accelerator to the paper towel so it is well wetted but no puddles or running liquid. While the work is turning, apply the accelerator to cover the entire surface. You will be depositing dry chemical for the most part so you won't see wetting or at least not on the entire surface. Apply until

you have fully covered the surface. Re-wet the towel if you feel it is necessary to complete the entire surface. Take a new towel and fold it until you have an application pad that has a good bit of thickness. The thickness will help avoid wicking adhesive through to your hand as well as minimizing the heat transfer. Apply Ca adhesive to a towel corner and then spread that on the turning as it is rotating. The goal is to make complete pass and avoid seams. Be careful of the heat that will be generated in your towel of Ca once the accelerator has been contacted. The goal is to apply a light coat that stays wetted from end to end. Depending on the size of the turning, you may not make it from end to end in one pass. If not, repeat using a clean corner or a new towel to apply Ca to the area not yet covered. I always place used paper towels in a safe place in the middle of my cement floor. There can be continued heat release so don't discard the towel into the trash until you are certain the glue has setup and is cold. I wait until the next day to pick them up and discard them. After the first coat of Ca over the entire surface, repeat



With your alcohol wipe flashing off, spray accelerator on to your folded paper towel. A wet coating but not running or dripping

the Ca application again. Because the coats are extremely thin, it takes many layers to build up any thickness. The adhesive can be applied almost continuously since the thin coats will cure almost immediately. The thinner the better. You can check for the set of the adhesive with a light touch of the back of your finger. Any tackiness means to let it sit for a few moments longer or don't put it on so thick. The process is one application of accelerator followed by three applications of Ca adhesive. Repeat this process as many times as you wish to get the build you want.





With the lathe running slowly, dependant on the work piece size, apply the accelerator to the surface entirely. You may not see wetting



Fold a clean paper towel segment thick enough to protect your fingers from the wicking of the Ca and from the heat generated



Apply the thin Ca adhesive towards one end of the folded paper towel. Apply enough to make a good wet spot but not sopping wet



With the lathe still running, wipe on the Ca adhesive flowing from one end to the other. You will see the wetting occur



Properly applied, the Ca will cure immediately. If you feel the need to check, use the back of the fingers with a light touch with lathe off



Repeat the Ca application process the same way ensuring complete coverage until three Ca applications are complete

## Go slowly & methodically

More Ca finishes are ruined because of hurried application. Like applying lacquer, for each application less is better. Go slowly with thin and repeated applications. The trick to having a spectacular finish is to build many, many thin coats until you reach the desired look and protective thickness. The protective aspects are obtained pretty early on. It is the look that requires all of the added coats. You can also take a break if needed. As you progress through your many coats of Ca finish, you can stop at any completed coat and walk away. There is no harm in letting things set as they are for an hour, day, or month. When you get ready to continue, should you take a break, be certain that the surface is clean. Don't let any



Repeat the accelerator application being sure that the application towel has dried prior to applying to the work. Apply three more Ca coats

accumulated dust or debris ruin the finish now. Get all of your materials out and ready as in Step 6 and continue on. How many coats is enough? Depending on your application,

20 to 30 coats isn't unreasonable. Remember, these are light coats that build. There are some spectacular hollow forms I've seen with 40 or more coats.



Continue to build to the desired finish. Use the same sequence of one accelerator application followed by three applications of Ca



The practice piece with only six coats of Ca applied to the flat cylinder surface. No leveling, sanding, or buffing yet. Imagine 20 coats



While you can level any ridges with 400 or 600 grit abrasives, you'll need finer to get to a high gloss or steel wool to matte back

## Sand out any flaws

The goal in applying a Ca finish is not to create any ridges or imperfections in the building process. It does happen however. You can stop anywhere in the process to sand out any flaws that have become apparent. You'll need to be certain that the Ca has cured prior to sanding. Once it is cured, you can sand beginning at a fine grit. Usually 400 or 600 grit is sufficiently coarse enough to remove ridges. You'll want to remove the flaws, usually radial ridges, by sanding by hand across the ridge. You only want to remove the ridge. Go completely around the turning until all of the ridges have been removed. Be careful not to sand through the applied finish especially at any corners. Work through the grits until any scratches you may have created are gone. You can use MicroMesh or the finer automotive finishing grits from 600 through 2500 as needed. You can continue to apply more Ca after cleaning the surface as needed.

## Going the extra mile

Ca finishes are not only protective but beautiful. You can control them from a super high gloss to a matte finish. Not many opt for the matte but if you wish, use very fine

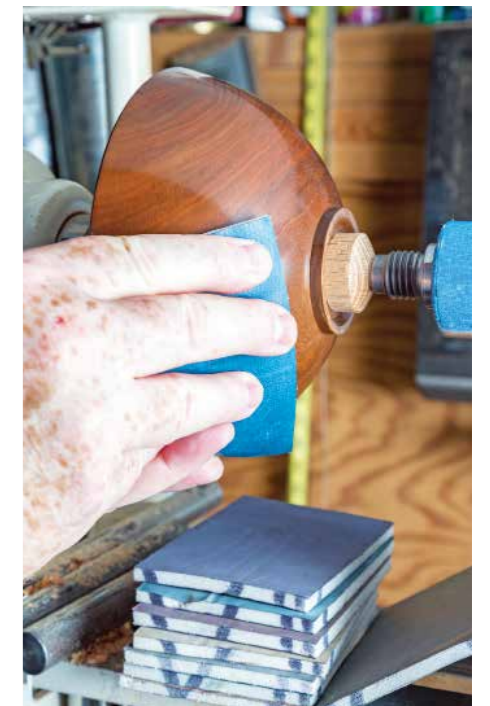
abrasive to bring down the sheen to the level you wish. If you want to take the sheen to the highest level, continue working through the MicroMesh grits at the completion of your builds. You'll need to begin in the middle to not remove too much finish. You're only bringing up the shine. If the surface is perfectly leveled, as it should be by now, you can begin with their 3200. That is finer than P2500 or 1200 on the CAMI scale. You be the judge. You can certainly wet sand as well as use automotive finishers type abrasives. Depending on your end goal, you can progress all of the way through 4000 grit if you are using automotive abrasive papers. You can always use some of the plastic polishes available. The cured Ca is indeed a plastic so fine plastic polishes or jeweler rouge on a flannel wheel.

## Conclusions

Is all of this necessary? Isn't this a huge time consuming effort when you could use a wipe on Poly or a friction polish? The answers are no and no. You certainly don't need to put on 40 coats and work through to 4000 grit. You can also skip Ca entirely if you wish. The explanation is far more daunting that it really is. The reason for Ca as a finish is the beauty and durability. Depending on the end use of your turning, you can put a rub and buff on it and put it on the upper shelf. If no



There are polishes with fine abrasives that are available. You can use these in combination with traditional abrasives or stand alone



Upon completion of a Ca finish, it can be brought to a high luster using the Micromesh sequence or extremely fine automotive paint abrasives

one ever touches it or uses it, that finish will last a long time. If you wish to have a finish that looks like peering into a clear pond or something that is tough enough for a pen, Ca will get it done. How long will it take? Depends on how proficient you are, how big your turning is, and how tough or deep do you want the finish. For a point of reference, I can put beautiful, durable Ca finish of 30 coats on a pen in less than five minutes. Not a huge amount of time to create a finish for a turning that has the toughest life there is. Larger items take longer but it still is a fast process. Whether you use Ca as an adhesive or not, I highly recommend you give using Ca as a finish. Properly applied, I don't think you'll find a better looking tough and durable finish for your turnings. ●