Gold Country Woodcrafters

CA IN YOUR WOODCRAFTING

Presented by Gail Cone

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What is CA (Cyanoacrylate)?

- Simple answer is: It is an ***liquid acrylic resin*** that rapidly polymerizes (becomes solid plastic) in the presence of moisture.
- There are many formulations of cyanoacrylate. The most common formulations are Methyl-2- cyanoacrylate and Ethyl-2- cyanoacrylate (Superglue) for general use. Forms for medical use are n-Butyl-cyanoacrylate and 2-octyl cyanoacrylate (preferred).
- For a good general reference for Cyanoacrylate look up Cyanoacrylate on Wikipedia.
- CA was discovered and patented in 1942 by Goodrich Company engineers developing plastics for a gun site for the war effort.
- Resurrected in 1951 when commercial applications were recognized. First sold in 1958 as “Eastman 910”.
- Eastman sold cyanoacrylate to Loctite in 1960s. Marketed as “Loctite Quick Set 404”. Marketing took off in the 70s. Super Glue, Crazy Glue, etc

Safety Concerns

- CA contact has been know to cause skin irritation or allergic skin reactions.
- Fumes can cause irritation of sensitive membranes in eyes, nose, and throat. About 5% of population can become sensitized to CA fumes after repeated exposure (flu-like symptoms).
- In very rare occasions the fumes have triggered asthma.
- CA quickly adheres body parts together or to other items which can cause torn skin.
- Heat is generated during polymerizing. An exothermic reaction occurs when CA meets up with natural fibers such as cotton, wool, leather. Also occurs with fiberglass and carbon fibers. Spilling CA on cotton fabric can cause burns, ignite the cotton and or release irritating white smoke.
- Note: To date there is no singular toxicity measurement for cyanoacrylate do to the wide range of additives in various formulations. Toxicity considered low.

Precautions, etc

- CA fumes are a vaporized form of CA and should be avoided. Use in well ventilated area (small fan helps) or vent fumes to the outside.
- Have some vegetable oil, commercial CA debonder, or acetone available.
- Always wear eye protection while working with CA.
- CA on skin will wear off, normally in a couple of days.
- CA is inert after it polymerizes. This includes CA fumes. When inert it is harmless….

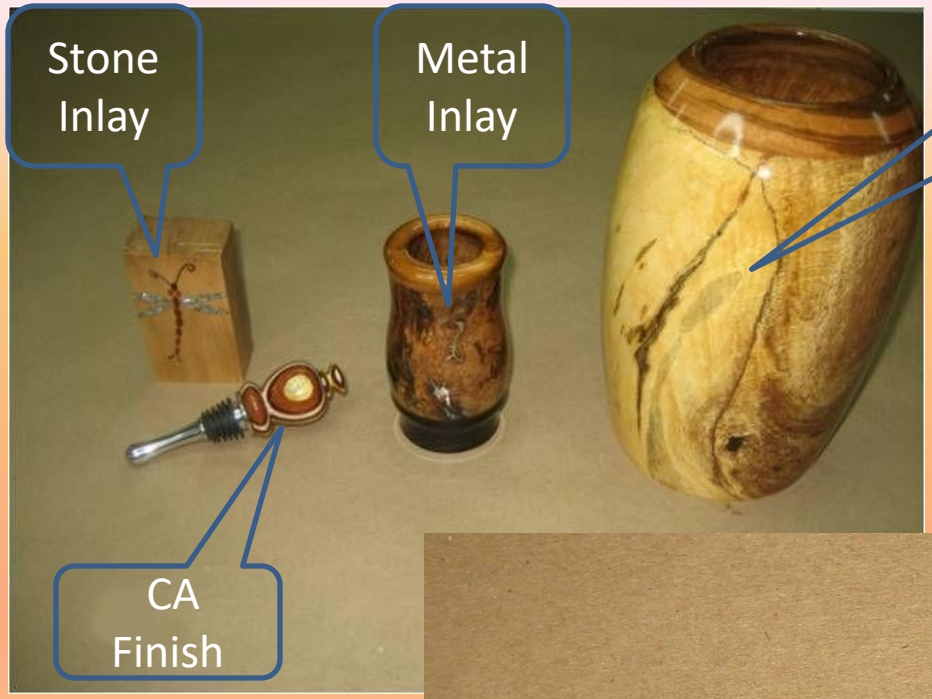
Storage

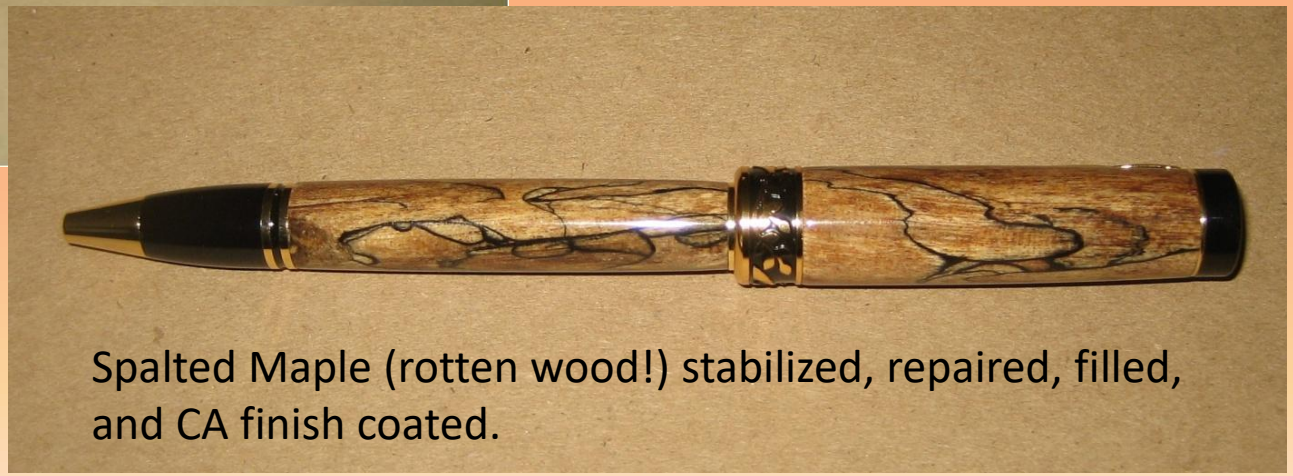
- In general the shelf life “from manufacture date” of CA is around 12months. CA starts polymerizing (becomes thicker) at the start.
- Shelf life can be extended by refrigerating unopened containers. Allow container and contents to reach room temp. before opening them. Opened containers “should NOT be refrigerated”.
- Some manufactures will advertize longer shelf life qualified by the temperature it is stored at.
- Recommend that you write the date on CA containers when purchased.
- Contrary to some beliefs CA should NOT be stored open.. Remember, CA polymerizes in the presence of moisture.

CA Applications in Woodworking

- Can stabilize/harden soft or punky wood, antler, etc
- Fixes Fillers for repairs to plastic resin fillings and inlays.
- Inlay artwork (stone, metal, wood, wood-dust, Marquetry)
- Assembly…
- As a durable finish for small wood projects.
- Repairs woodworker fingernails, small cuts.
- Note: CA is not a filler by itself. It requires added material to occupy wide spaces. CA fast polymerizing action occurs on thin layers.
- Other Applications: Forensics, Medical, Modeling, Archery, Cosmetics, Electronics, general repairs, to name a few.

CA Application Examples





Spalted Maple (rotten wood!) stabilized, repaired, filled, and CA finish coated.

CA Application Examples (Cont.)

Vase with maple burl. Burl voids filled with aluminum powder and leveled prior to applying finish.

Items Used In CA Finishing tasks

Why a CA finish?

- CA is a popular choice for a finish that is durable and stands up to repeated handling. It has become a favorite for small items such as pen, seam rippers, stoppers, finials, etc.
- Alternative materials that can be used to obtain a durable finish are 2 part epoxy and lacquer. **Friction finishes just don't cut it!**
- CA Finishing is highly individualized and most professional pen turners each have their own process. I am presenting MY VERSION (and it continues to be refined).
- Check out U-Tube for CA Finishing, on the internet to view alternate procedures.
- A CA finish can be applied to larger projects but the process is much more involved and requires much more time, material and patience.
- Materials that accept a CA finish: wood, antler, stabilized wood, polyclay, etc.

Before the finish

- The key to any successful finish is surface prep. Prepare your blanks by sanding to at least 600 and be free of major defects. Complete each grit by sanding with the grain. Wipe off all the dust. Wipe oily woods with acetone when done.
- Clean the area around the lathe. Cover lathe bed to protect it from CA and water.
- Use plastic cone bushings on mandrel to hold and separate the project blanks, highly recommended. The cones are turned from UHMW plastic stock. They can however be purchased.

- Gather items needed ahead of time: Super thin CA, Gap filling (medium) CA, paper towel pads, aerosol accelerator, 400/600 wet/dry paper strips, plastic polishing pads, container of water and paper towel.
- Inspect CA containers to make sure tips are free of loose material.

Before the finish (cont.)

- Use an accelerator aerosol for a high atomization. High atomization helps prevent the CA from bubbling up. Pump spray bottles **will** cause problems! I use NCF Quick (approx. 8” from project).
- Metal bushings can be used but should have a light coating of wax applied to help prevent CA from sticking to them. Without wax you risk damage! Normally a slight tapping will release bushings.
- I use Viva paper towels. Recommended by select professional pen turners.
- Protect finger with green tape for CA coating procedure. Variation: use a plastic bag from kits to protect finger.

Don’t forget eye protection!

Applying CA Coating

- **Thin:** Apply at least 2 coats of thin CA (Seals blank).

- Run lathe at around 400RPM.
- Apply CA to blank at top while holding corner of paper towel under blank.
- Distribute CA evenly across blank by moving towel back and forth to distribute CA.
- Apply a few puffs of accelerator to blank at a distance of 8” or so.
- Use a new area of towel for each coat of CA.

- **Thick:** Apply at least 4 coats of gap filling (medium) CA (builds finish).

- Use the same application procedure as with thin CA.

Make it Shine

- Run lathe at around 750 RPM.
- Start wet sanding with 600 wet/dry paper. Use 400 if heavily blemished then progress to 600. Discard 400/600 after use.
- Wipe off the surface and stop lathe often and note any shinny spots.
- Repeat 600 until all shinny spots are gone. Caution, don't overwork the 400/600 on or near edges as there is a danger of cutting through the CA coatings.
- Use micromesh pads or similar product "wet" starting with 1600 and progress through 2400, 4000, 6000, and 15000. Wipe off the blank between each grit (only a few seconds with each pad). Pads are reusable many times over.
- Polish using liquid 20/20 plastic polish. Apply polish and buff. Additionally use acrylic buffing compound with a buffing wheel if desired.

Notes

- More coats promote a higher brilliance as each coat will trap additional light.
- CA coatings do increase the blank diameter slightly so plan for this when shaping your project.
- Try not to get too much CA over edges of blank..
- Apply additional coat/s of thin CA over thick to even out a finish if needed.
- Clean any CA from the ends by carefully sanding on flat surface using 400 paper.
- On finished project, coat with micro-crystalline wax (museum wax) to retard finger prints. I use Renaissance.

Fixes

- If you sand through the CA finish coatings you can recover by minimally dry sanding with 600 to even things out and applying more CA coatings. If it doesn't look good you can completely remove all CA coating and refinish.

- Take great care when pressing pen parts to blanks, etc. Make sure you have cleaned the blank ends to minimize cracking/chipping the finish.

- Damaged/chipped ends from assembly can be repaired by dabbing the blank end in a bead of CA. Then, if needed, polish the repair (carefully).

- Run The Video ~8min.