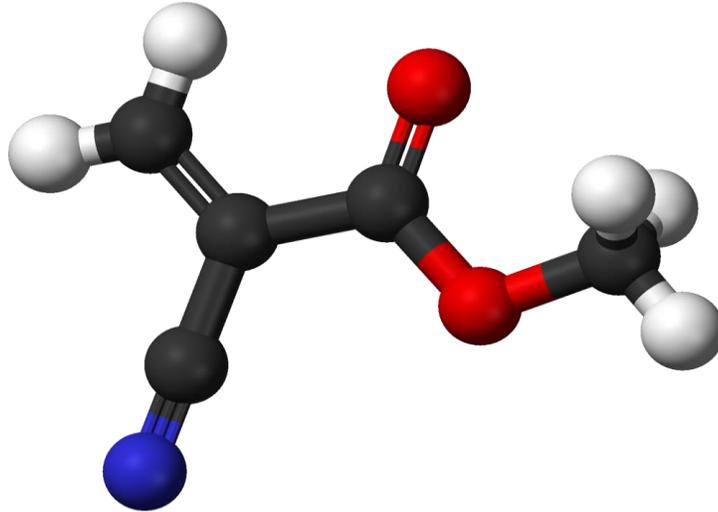


Cyanoacrylate: Everything You Need to Know

Cyanoacrylate (sigh-an-no-ack-rill-ate)

When cyanoacrylates first burst onto the scene with distinctive trade names like Crazy Glue, Super Glue and Hot Stuff, they brought unimagined speed to the field of adhesives. Cyanoacrylate (or CA in shorthand) is the fastest setting of all adhesives. A variety of formulations exist from ultra-thin to thick gels, and with setting times that vary from just one or two seconds to over a minute. They are all clear, waterproof, and require no clamping, so you can



simply hold parts in place until the glue sets. CA is triggered by either moisture or alkalines, but once it starts to cure it continues on its own, making it a true one-part self-crosslinking adhesive.

Characteristics

Cyanoacrylate is instant adhesive, so you have little or no time to align parts. Manufacturers offer very watery versions, which are too thin to be gap filling and only work on perfectly mated parts, or gap filling thick versions which usually dry slower and work better on wood. CA will bond a variety of materials including glass, ceramics, plastic, abalone, etc., and special versions are offered to deal with oily woods and bonding metals to wood. It can be used at almost any temperature both indoors and out. In all cases, CA forms a permanent waterproof bond, but you can reverse it with high heat (above 350 degrees F) or a special debonder solvent.

Use For:

- Fast setting or where clamping is impossible
- Repairs (it will stick to old glue)
- Glue size to seal end grain before staining
- Crack or gouge filler when added to sawdust
- Mounting green or dry blocks for turning
- Finish on green or dry wood
- Repairing chips in high tech finishes
- Wood sealer to eliminate pinholes, and it case hardens

Avoid:

- Complicated assemblies requiring long open time
- Jobs where glue cost is an issue (it's expensive)

Oddball Uses

Cyanoacrylate has been used for fingerprint analysis, solidifying fragile bones during archeological digs, repairing the crushed shell of a live tortoise, sealing petrified wood for lapidary, repairing a crumbling smokestack, assembling satellites, and gluing live bait to fish hooks.

Using the Adhesive

Start with a clean, dry surface. Apply CA to one side of the joint, then quickly press the parts together and hold them until the glue sets, usually in less than a minute. Don't spread out the drop or bead, but instead let it squash when you join the parts. The more CA is spread out, the faster it will cure, and it won't cure in a large puddle.

Use the smallest amount you need. Normally, one drop covers one square inch, but you'll need more on porous surfaces including most woods. Excess glue does not add more strength. For very absorbent wood or open grain,

use one of the thick formulations. CA cures slower on acidic woods like mahogany and oak, but you can use accelerator to overcome that. (see below – About Accelerator) .

To avoid clogging the tip, don't touch it to the work or any surface, and don't poke pins or nails into the opening either. If it does clog, unscrew the cap and remove the plug by pushing it through, or by soaking the cap in debonder. The debonding solvent is nitromethane, known to racing buffs as funny car fuel. Acetone will work in a pinch, but it works VERY slowly. It is a good idea to always have a bottle of debonder on hand, especially since you are likely to glue yourself to something at some point. Trust me, it's inevitable.

Cyanoacrylate will stick to finish, but applying paste wax will block the glue. On the other hand, you can glue to a finished surface, something few adhesives will do. It will stick to old glue, so it's ideal for repair work. CA is also frequently used to fill small chips in lacquer, polyurethane, and polyester finishes. Turners and luthiers fill cracks and small voids in raw wood by filling them with sanding dust, then dropping CA into the powder to form a solid plug. Thin versions will seep into even the smallest of fractures. Because it is moisture activated, it will work on wet wood, green wood, and pressure treated wood. Some folks use it as a finish or as a sealer under other finishes. Some turners alternate wet-on-wet coats of CA and boiled linseed oil to create an instant curing, extra hard oil finish.

About Accelerator

It seems odd that the fastest of all glues would need an accelerator, but it actually does more than just speed up the cure. You'll get a better bond on oily or high acid content woods if you spray or wipe accelerator on one side of the joint before putting glue on the other. You can also speed up a bond by spraying accelerator on it after the parts are together. There are two common types of accelerators. When you use those that say "flammable" on the container, wait 60 seconds after you apply it before you join the parts, or before you spray accelerator onto a glued surface. Spraying these accelerators too soon can turn the glue white. For non-flammable accelerators, there is no waiting time needed. Wiping one side of the joint with water, alcohol, or baking soda also speeds the cure, but results in a substantially weaker glue bond and can also turn the glue white.

Warnings

It's a good idea to wear disposable gloves and goggles to keep the glue off your hands and out of your eyes. CA is a bit like cutting onions in that the fumes are irritating to your eyes and lungs, but not particularly harmful. Contrary to internet rumor, CA is not carcinogenic and it does not contain cyanide. However, it is flammable. It will stick to skin, so be careful not to glue yourself to objects or you might end up as the topic of the next *American Pie* movie.

Storage and Shelf Life

How long CA lasts is affected by the size of the container. Smaller amounts have a shorter shelf life than larger ones. A 2 oz bottle will last at least a year at room temperature. Do not refrigerate opened containers as that can clog the tip and make the glue harden in the container. You can double the shelf life by freezing, but only unopened bottles. Let them warm to room temperature before you open them and don't refreeze them.

Other Important Information

- Some formulations are oily and/or hard to adhere woods
- Mixed materials – yes
- Some (NOT all) can be used for gap filling
- No clamping required
- Open time: a few seconds
- Cure time: under a minute
- Waterproof
- Submersible
- Apply to one side
- Neither expands nor contracts while curing
- Emits irritating and/or dangerous vapors