

POPULAR MECHANICS

What's So Super About Super Glue?

We tested the popular adhesive and show you how to use it properly.

BY ROY BERENDSOHN PUBLISHED: NOV 13, 2023



Roy Berendsohn

On a Wednesday evening, January 7, 1959, Americans would learn of a new substance—cyanoacrylate. Eventually, it would become known as super glue. Chemist Harry Wesley Coover, Jr. appeared as a guest on the popular TV show, “I’ve Got a Secret.” Dressed in a crisp suit and tie, Coover used a single drop of the adhesive to bond two pieces of steel. A minute or so later, he and host Gary Moore were hoisted into the air by the bars. American society hasn’t been the same since.

Fast forward less than a decade later and a medical grade version of the adhesive was saving soldiers in Vietnam by quickly closing battle wounds as it’s used in place of su-



*We glued together two pieces of cherry with super glue and after letting the sample cure for two hours, clamped it in a vise and hit it with a hammer. The wood failed, but the super glue did not. **BSI Insta-Cure***

tures. Between then and now, it's been used in countless home repairs, industrial applications and innumerable marketing stunts.

I confess that I rarely use super glue. Most of my experience with it was when our offices were located in New York City. I kept a tube of super glue in my desk drawer. Invariably, colleagues would come to me with something that broke to ask if I could fix it: eye glass frames, shoes, buckles and clasps, sometimes shoe heels, the handle on their favorite coffee mug.

The memories of all those repairs came back to me when I ran a series of rough-and-ready tests using JB Weld. That epoxy-based adhesive, I learned, is as tough as its manufacturer says. I had the same thought about the general class of products known as super glue. Is it any good?

So I picked up some samples of the popular adhesive at a local home center and received a box of samples from Bob Smith Industries (BSI), a super glue manufacturer based out of California. BSI specializes in professional-grade versions of the material for hobbyist, model making, and industrial applications. I tested all these glues out on a variety of materials and came away thinking that super glues are super, but you have to know how to use them.

A Little Sticky History

The first thing to understand about super glue is that it's not epoxy. Epoxies are two-component adhesives consisting of an epoxy resin and a hardener. These may be in the form of syrup-like gels or two-part putty that you mix together. Many J-B Weld products are epoxies.

Homeowner-grade super glue is single-part liquid or gel adhesive (there are industrial versions of the glue that are two-part formulations). Coover said on his TV appearance that the material was discovered by accident while searching for high-temperature plastics for jet cockpits. A researcher working with him accidentally glued together two glass prisms in an expensive piece of lab equipment. Although the lab equipment was ruined, Coover realized that the material would make an outstanding fast-bonding adhesive. Because the glue was the 910 on a list of materials that they were developing, they named it Eastman 910, after the company Coover and his researcher were working for, the Tennessee Eastman Corporation.



Photo by: Trevor Raab

A selection of super glues I found at my local home center, and are relatively thin, free-flowing materials. is thicker and easier to work with on vertical joints or on surfaces such as wood's end grain where you don't want the adhesive to absorb immediately into the substrate.
Flex Loctite Super Glue, Gorilla Super Glue Gel

Coover was frank in his TV appearance that the substance was too expensive for homeowner use. Eastman 910, he said, was strictly an industrial substance. It was only decades later, after the patent had expired, that the glue became popular for household repairs. There are dozens of variations of the adhesive manufactured today.

How To Be Super With Super Glue

Every adhesive requires your participation. Not every glue works in every application. Super glue is no exception. There are hundreds of applications for this material, and probably several dozen common applications and techniques that you need to know. We'll boil it all down to a few basics.

Don't Glue These Materials

Never use cyanoacrylate to bond cotton, wool, burlap, or blends of those materials with synthetic materials such as polyester. Cyanoacrylate can react exothermically with these materials, and the reaction is so powerful that it can produce smoke (maybe even catch fire).

I've read about this reaction and to verify whether it's true, I tried it out by applying a heavy bead of liquid cyanoacrylate on a patch of porous, wool synthetic blend fabric. Within seconds, there was smoke pouring off the patch and an acrid stink from the melting synthetic fibers.

Based on my little experiment, I think the material is particularly dangerous in proportion to the porosity of the material, which allows air to be pulled through, accelerating the exothermic reaction.

A final caution: super glue is sold in small quantities because a little of it goes a long way. Still, if you need to use a large amount of the material, do so in a well ventilated area.

Unglue

Consult the manufacturer's data about using an appropriate chemical debonder if you accidentally glue your fingers together or you need to rework what you just bonded. Usually acetone or MEK will work, but consult the manufacturer's instruction. You can also buy dedicated debonder. I strongly recommend that you keep this stuff on hand whenever working with cyanoacrylate.

Use the Right Glue

Super glue can have a thick or thin consistency, up to the point of being a gel. Use thick glue where you need the adhesive to stay put, such as on a vertical surface. Also use thick glue on surfaces that absorb the adhesive such as leather, cardboard, and the end grain of wood. These surfaces will absorb the glue to such an extent that they will starve the glue joint of enough adhesive to make a bond. It's also handy on surfaces where, when pressed together, there will be some squeeze out. Thicker glues will not run down the side of the surface.



Photo by: Trevor Raab

Super Glue is a strong, medium viscosity product, suitable for general household repairs. There are waterthin varieties of super glue that are particularly useful for bonding breaks in thin delicate materials, such as porcelain. Loctite's super glue



Photo by: Trevor Raab

Super glues have a reputation as being so powerful that they accidentally stick together everything from peoples' fingers to parts in the wrong position. Applying a little cyanoacrylate glue remover dissolves the adhesives and allows parts to be removed and repositioned or—in the worst case—people to unstuck their fingers.

Super glue can also be slightly thicker than water. This is perfect to bond hard materials that will not readily absorb the glue. It's also great where you are concerned about a glue line showing through the joint. Some super glues are so thin, you can tape together the part you need to repair and apply the glue to the outside of the joint and let it wick in by capillary action.

Stating the Obvious: Read the Package

Super glue is formulated for both broad and specific applications. Without reading the package, you'll have no idea. Some formulations work across a broad range of materials and applications. Other super glues are somewhat specific. The package will tell you how quickly the glue sets, whether it's thick or thin, and whether it offers good shock resistance. It will also tell you what materials it can be used on



Photo by: Trevor Raab

Extra-thick versions of super glue are useful for vertical and overhead applications or when applying the adhesive to plastics and on materials (such as the end grain on some hardwoods) that will have a tendency to absorb it. Note that this product's cure time is 10 to 25 seconds. Unless you use an accelerator, you would need to clamp the parts together to hold them perfectly motionless while the adhesive sets. **Extra-thick versions accelerator**

and what materials it cannot. Some super glue formulations stick reasonably well to a wide variety of plastics. Others do not. Some formulations can bond foam and foam rubber while others will dissolve it.

Mind the Gap

Some cyanoacrylates are specifically formulated to form a bond across gaps—some of them pretty large. We've seen product specs of industrial versions that will bridge a gap as large as .200 inch. In the world of adhesives, that's like bridging the Grand Canyon. In most cases, gap filling is somewhere in the range of .004 to .008 inch.



Photo by: Trevor Raab



Photo by: Trevor Raab

Read the package or visit a manufacturer's website to find a super glue appropriate for your application. BSI

Super-Gold+ is rated as safe for all types of plastic foam. Some super glues dissolve these materials or bonds them weakly. This glue is also rated for clear plastic, fiberglass, and ceramics.

Look for a when you need to bond across a joint that is less than perfect. Some cyanoacrylate adhesives bond effectively across gaps and others do not. Gap-filling super glue

Surface Prep Matters

Super glue is no different than any other adhesive in that the smoother and fatter the two joining surfaces, the better the bond. When bond strength is critical, grind, sand or clean the surfaces to remove paint, rust, mill scale, dirt, grease, and wood finishes.



We took two pieces of square tubing and ground their mating surfaces flat and clean, then applied a medium-viscosity super glue.



After applying super glue to one side of the sample, we pressed the second piece into position and moved in a circular motion to distribute the super glue on the joining faces (known to engineers and chemists as the faying surfaces, the surfaces that make contact on a joint). We did not apply clamping pressure other than pressing down with our hands. After about 30 seconds we let go.



Approximately a minute after making the joint, we could lift the sample by the upper piece. Approximately two hours later, the sample was strong enough to withstand three heavy blows from a ball peen hammer before breaking apart.

Hold Steady

Even slight movement is enough to break the bond that super glue is forming. You need to either hold steady or use a clamp to provide consistent pressure to the joint.



Use an Accelerator

When you need a perfectly glued joint, use an accelerator to freeze the joint in position. Accelerator is a catalyst that can be applied on one side of the joint while super glue is applied to the other. In other cases, it can be applied to the glue that squeezes out of the joint, hardening it nearly instantly. To read more about it, go [here](#).

Acceleerator is a catalyst applied to super glue joints to speed the adhesive's cure. It's particularly useful in some forms of woodworking. You can freeze a wood joint in position with super glue, before shooting a fastener into it with a pneumatic or cordless nailer.

Photo by: Dennis Swanson, Studio 101 West



Roy Berendsohn
Senior Home Editor

Roy Berendsohn has worked for more than 25 years at Popular Mechanics, where he has written on carpentry, masonry, painting, plumbing, electrical, woodworking, blacksmithing, welding, lawn care, chainsaw use, and outdoor power equipment. When he's not working on his own house, he volunteers with Sovereign Grace Church doing home repair for families in rural, suburban and urban locations throughout central and southern New Jersey.