

# The Ten Most Common Epoxy Mistakes:



Epoxy adhesives are a valuable 'chemical tool' that can save the day in the garage, in the shop, or around the house. Whether in a liquid or stick form, epoxies can create bonds that are strong enough to last for the life of the items you've repaired. But to make sure you get the results you're hoping for when you use an epoxy adhesive, avoid these 10 common mistakes.

## Here are ten common mistakes that even some pros make when using epoxies:



Epoxies work best when the mating surfaces are completely clean, dry, and free of grease, oil, dirt, moisture, and other contaminants.

### Not cleaning or sufficiently preparing surface

Like most any adhesive, epoxies work best when the mating surfaces are completely clean. Both surfaces should be free of grease, oil, dirt, and other contaminants, and the surfaces need to be dry as well.

Be aware, some cleaners can leave behind a residue that will interfere with the epoxy bond. When you can, use solvents that won't leave a residue such as isopropyl alcohol or acetone - but test these solvents first to check that they won't damage a visible part of the repair item. Always wear solvent-resistant gloves, respirator, and eye protection when using acetone.

If you can't use a solvent, use a high-quality, residue-free industrial cleaner such as Spray Nine. When using any cleaner that's not a solvent, be sure to thoroughly rinse with clean water and dry the surfaces completely before starting your repair.



A specialty epoxy formulated for use on metals is ideal for repairing this valve cover.

### Choosing the wrong epoxy for the job

Epoxies come in a variety of formulas. Pick the one that's right for your job.

If you have a simple repair that won't be subjected to high forces or stress, you can use a 60 second, general purpose epoxy. But if you need a higher strength bond, you should use a 30 minute, high-strength formula. It'll take longer to set, but give you greater strength. A 5-minute epoxy splits the difference in terms of the required cure time and the strength of the bond.

If your repair will be regularly exposed to water, choose a waterproof epoxy - some epoxies will degrade over time if regularly exposed to water. Most epoxies are water resistant compounds once cured, however there are unique formulas made specifically for underwater repairs.

There are also specialty epoxies available for metals, high temperature applications, and plastics. Do the research and find the one that's best suited for the repair you have to make.



A successful epoxy repair depends on timing - make sure you know how much time you need to mix, assemble, and fully cure.

### Misjudging epoxy hardening time

Many DIYers use a 5-minute epoxy and believe that it'll harden in 5 minutes. The number of minutes in an epoxy's name is not the time it takes to harden, but the amount of time that you have to mix it together, apply it, and bring the repair pieces together (known as the "working time").

The time that it takes to harden to the point where the repair is safe to handle (referred to as the "fixture time") is longer than the "working time." The time when the repair has fully hardened is the "cure time."

The bottom line is - check the package to learn how much time the epoxy needs for working time, achieving fixture strength, and full cure.

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*Make sure you hold or clamp parts together long enough for epoxy to bond properly.*

#### **Not holding parts together long enough for proper bonding**

A 5-minute epoxy may need 10 minutes to fully harden. You may want to use clamps, rubber bands, or weights to hold your pieces together, rather than try to hold them perfectly still for 10 minutes with your hands. Holding parts together by hand may result in a weaker cure due to hand fatigue that will not allow for constant pressure.

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*The two parts of the epoxy stick should be kneaded until they are a uniform color.*

#### **Not kneading epoxy sticks enough or too much**

Epoxy sticks are two-part formulas with an inner and outer layer of putty-like materials. To activate the bonding, the two parts must be thoroughly kneaded together. If you don't knead the two parts into a completely uniform color, you'll have pockets of epoxy that never fully cure.

On the other hand, if you knead for too long, the material will start to cure before you apply it, losing its adhesive performance. Again, read the package instructions to get your timing right.

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*Rough up the mating surfaces to create a good grip for the epoxy.*

#### **Applying epoxy to a smooth surface**

It's difficult for any adhesive to form a strong bond if the surfaces are too smooth. Whenever possible, rough up the mating surfaces before you begin to give the epoxy a surface that it can 'grip.' You can use sandpaper or a mechanical tool to score the surfaces, but don't overdo it. You want to roughen the surfaces, but not so much that you change the shape of the mating pieces. Score the surfaces, but don't overdo it.

Roughen the surfaces before you do your cleaning prep. You'll want to clean away all the loose material raised by roughening.

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*The ideal container is one that will not melt or react with the epoxy. It should also be disposable.*

#### **Mixing epoxy in an unsafe container**

Epoxies heat up as they cure. Some can get hot enough to melt right through a disposable plastic cup. Choose a container that won't melt or react with the epoxy.

Glass and ceramic are always a good bet, but don't count on being able to get the residual hardened epoxy out. Pick a container you're willing to toss when you're done.

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Avoid direct sunlight while making a repair with epoxy.

### Letting epoxy harden in direct sunlight

Many epoxies will yellow if they're allowed to cure in direct sunlight. Always cure in the shade, if possible.

Epoxy that is fully cured will also yellow if left in the sun for long periods of time. If that will be cosmetically unacceptable, look for a different adhesive solution.

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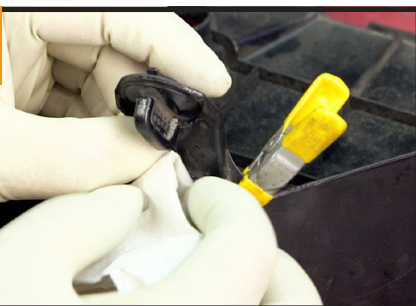
Epoxies may not be as suitable as other types of adhesives for repairs requiring a thin glue joint.

### Using an epoxy to make an extremely thin repair

If you're gluing a handle back on a ceramic mug, a really thin glue joint may be more important than the high strength that epoxies provide. Epoxies are extremely strong, but they do create a bit of material thickness between the repair pieces.

For extremely thin repairs use a 'super glue' (cyanoacrylate-based adhesive). For repairs where high strength and the ability to fill gaps or voids are needed, use an epoxy.

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Epoxy residue should be removed before it hardens.

### Not cleaning up excess epoxy before it cures

Cured epoxy is really hard to get off most surfaces. In many cases, cured epoxy can only be removed mechanically or by scraping. Clean off any excess before it hardens!

Try not to let any epoxy cure where you don't want it. If you do get uncured epoxy on your parts, wipe it off with acetone (test acetone on the material surface first, always wear solvent-resistant gloves, respirator, and eye protection when using acetone).

If epoxy should harden where you don't want it, heating it with a hair dryer or professional heat gun can soften the epoxy to make it easier to remove. Of course this step may not help with high temperature epoxies.

If you get uncured epoxy on your skin, first wipe it off with a clean cloth or paper towel and then use a professional-strength hand cleaner such as Permatex Fast Orange and lots of water to get the rest off. Be patient, it may take some time to remove it.

For more information about Permatex Epoxies and other repair products, please visit: [www.permatex.com](http://www.permatex.com)

Whether you're a full-time auto repair pro or dedicated do-it-yourselfer, epoxies are a handy and valuable product you'll want to use regularly. Keep clear of these common errors and your assemblies (and your customers) will thank you.