

## Bonds, Reinforcements and Supports

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The photos in this story show several pieces of damaged ornate gold lady figural, representing one top section of a tall frame. The entire body of this frame includes a full-length mirror, over six feet tall. As with many large frames, the ornate sections include metal rods inside the body for added support. If the metal rods are bent when the damage occurred, necessary corrections to realign the design may cause even further damage.

A household adhesive for normal glue jobs will not work on most damaged objects with bulky, heavy or crumbly (soft-bodied) parts. If the object also includes metal rods within the body, the task to bond all the broken parts back together can be challenging. Normally, a stronger industrial adhesive will be needed.

There are many two-part adhesives and epoxies that can be considered, depending on the "body type" of the damaged areas. For instance, a glass object would need to be bonded with a product specific for glass. It might even need a glass liquid etcher treatment prior to application of the bonding adhesive. It is best if glass is bonded with a clear, non-yellowing adhesive product.

With the broken top figural sections of the tall mirror frame, it would be best to use a medium-bodied, two-part industrial adhesive epoxy glue with "non-sag" capabilities for the first step in bonding. This ornate gold top is very porous, lightweight and chalky. The use of a "non-sag" industrial adhesive epoxy will aid in adding strength and support to the areas to be bonded.

To further aid with support and reinforcement, the bonded joints of the ornate top would need some additional filler products that can provide additional strength. In addition, there are two-part thermal fillers. These come in various consistencies and color and each has its own unique purpose. These are useful to bond broken areas together without first requiring any glue type adhesive.

The easiest way to consider which two-part thermal filler to include is by comparing the properties of a "cured" ball-type sample, "cured" with the "body type" you are working on. Select the sample that comes closest to



This broken bust of a lady figural sat atop a tall mirror frame. It's gold with a chalky inside body type, with metal rods within for supports.



Top of mirror frame without ornate lady figural bust and side acanthus leaf molding. Metal rods stick up where gold leaf top was broken off.



Examples of various "color"

the same texture, weight, color and strength of the parts you are trying to bond, reinforce and add support to.

Some examples of the various types of two-part thermal fillers are:

- **Repair It Quick** - recommended for thick, heavy objects such as marble, stoneware and heavy frames.
- **Quickwood Light Fill** - use for medium-weight objects such as pottery, terra cotta, soft-paste porcelain and some frame types.
- **Quick Copper** - can be used for medium-weight objects and matched to the object's "color" such as copper, bronze and some darker surfaces of frames.
- **Quick Aluminum** - can be used for medium-to-heavy objects and matched for "color" such as silver, pewter and some metal type frames.
- **Quickwood Pine** - good for "gold" or yellow backgrounds as the base color in the case of many frames and other objects such as some pottery, etc.
- **Quickwood Dark** - also good for frames of a darker background, such as mahogany, etc.
- **Quick Crete** - can be used for "outdoor" garden objects or most any other concrete type structures.

There are more, but these are a good base to get started on many restoration projects with various body types.

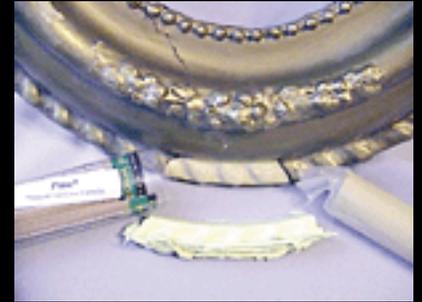
For smaller, lightweight bonding jobs there are some easy-to-use commercial brands of adhesive available at most hardware stores, such as a liquid or gel with applicator. These work for joints that are a clean break and fit almost resting or locking into place. Over time, these adhesives may come apart due to heat, moisture and stress on the object

Most products that are pre-mixed can have a "shelf-life" expiration. So, when purchasing an adhesive, try to select a store that would have a fast turn-over of inventory to aid in obtaining a fresher product. To extend the life, placement in an average refrigerator is recommended. Be sure to allow the product to reach room temperature before using. Sometimes better results can be obtained if the object to be bonded is slightly warmed.

Discard any unused portion of adhesive after opening within a couple of weeks. Most old, opened and unused portions will no longer adhere properly. Unfortunately, the object will fall apart within a few months if the adhesive was expired during use.

If the broken edges of an object have old residues (such as glue) remaining, it is important to remove it. If this requires a wet cleaning product that may have had time to absorb into the broken areas, allow

two-part epoxy materials used for bonding, reinforcement, support and even part making.



Missing section of a yellow/gold frame. Yellow mold material is a heavy formula. The thermal epoxy fill was placed within that mold and attached to the frame all in one step.



Some industrial-strength adhesives used in the bonding process.

plenty of time for the parts to dry out before bonding.

It is sometimes helpful to sand lightly or etch the surfaces before joining with adhesive. This process can aid in further removal of any remaining old glue and other residues. It also aids in creating fresher areas for the new application of the correct bonding agent, allowing it to latch on and/or grab into the inner wall surfaces of the broken joins for a stronger hold.

In some instances, bonding and/or epoxy thermal fills are not enough to hold some objects together due to the overall gravity in design, weight and stress points. In some cases, it may be necessary to include additional support with alternative products.

There are old examples of restoration where objects were "stapled" together with various types of wire. They drilled holes into the broken parts, wrapped wire through to connect at the joins and then filled the holes. With today's excellent product sources, it isn't necessary to have wire staples. There are many clear materials that can be applied in key areas to coat joins and add a blanket of outer wall strength. Depending on the surface, these products can be clear high gloss, semi-gloss, satin and matte.

If all else fails, the project may need to take on an additional design of material that offers more support, such as application of a new layer or vining-type structure with strong base material. This will change the original view of the piece, but can sometimes offer a better solution with pleasant surprises for a totally new look.

A word to the wise: bonding parts together isn't always as easy as it looks. It is best to practice the order in which the sections best fit back together before the application of the adhesives. This will aid in preventing a section from being "locked out".

Less is better, so do not apply too much of the adhesive to the joins and only apply to one of the two areas fitting together. Try not to overlap into another section that will need to be joined. The more broken edges, the more the piece will expand as adhesive is applied and may become distorted if each join isn't carefully aligned.

If attempts to bond result in a mess, it will be an added cost when seeking a professional restorer. A restoration specialist will normally charge for the extra process involved in removal of "old" bonding agents and the clean-up of surfaces.

In addition, if the item requires the inside to be restored, a restorer will normally work on the item in halves to obtain an invisible restore before completing the item as a whole. This allows the inside areas accessible

to be worked on in more detail. A professional restoration specialist will have the best products, will obtain a better alignment and fit, and the bonding will be compatible to the further processing of an invisible restore.

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