

# Restoration

## Damaged Crystal and Glassware



by DiAnna Tindell

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The restoration of glass and crystal is not as simple as you might imagine. Glass is mechanically rigid and, in this sense, behaves like a solid. However, the atoms within the glass are arranged in a random fashion. Such disordered structure is the characteristic of a liquid. In contrast, each atom in a crystalline solid is held in a definite position within a structural pattern or lattice. In glass, the atoms, though arranged at random, are frozen in position. Thus, glass combines some of the aspects of a crystalline solid and some aspects of a liquid. For this reason, there are many environmental changes that can control the outcome of a glass item before or after a restoration.

It may seem strange that glass is a non-crystalline material when fine art glass is called "crystal." The designation "crystal" was created many years ago when someone looked at a piece of exceptionally brilliant glass and described it as being "clear as crystal." The term crystal refers to external appearance, while the term crystalline refers to internal structure.

In crystal and glass restoration, the specialist is often called upon to create new parts, bond existing parts together, fuse or fill in cracks, remove scratches and stains, reapply golds, silvers, paints, etching and frosting and, through the use of molds, duplicate the original piece.

One of the most common requests for glass and crystal restoration involves the repair of a chipped area. Normally, depending on the location of the chipped area and the type of piece, a restoration will include grinding the damaged area down, reshaping and polishing it back to a clean, clear surface. Unfortunately, many glass and crystal repairs are far more complicated, as in the case of deep scratches, cracks, broken or missing parts and stains.

Clients will often ask the restoration specialist to "reheat" their cracked or broken glass to fuse the piece back together.



When glass is reheated to fuse a crack or add a broken piece, it will often be unable to withstand the heat and shatter. Newer or more reliable methods of making glass, however, allow for reheating of the piece in some instances.

A crack can be stabilized or pieces may be fused together through the use of "cold" processes. In the case of a crack that has opened on the surface of the item, a non-yellowing liquid filler can add support and eliminate the reflection of light that makes the crack visible.

When attempting to bond broken pieces of glass together, a non-yellowing adhesive should be used that will also provide strength and support. Usually, the area where the broken pieces are joined will hold better if the fit is snug and the surface area not too thin. It is best to use an etching product to create a microscopic abrasion prior to an application of the bonding agent, giving the bonding agent more to "grab" onto.

If the area being repaired is designed to withhold substantial weight and stress, it may be wise to provide additional support to the restored area with the broad application of a clear (invisible) material that would act as an overlay. Modern science has given the restoration specialist the ability to replace missing parts with new parts made from synthetic liquid glass. These parts can be made clear or, through the use of additives such as paints or metallics, made to reproduce any special effect needed for the project. In addition, a new part can be made clear with the addition of specialized outer applications of paints and more to recreate a particular surface texture.

"Sick" glass is glass that has a stain that cannot be removed by normal cleaning. Methods are available to restore the



"sick" glass to its original appearance. However, most of these specialized cleaning methods would require an experienced restoration specialist. They include the use of equipment that can rotate glass items with specialized materials placed within for a long period. Some stains can be removed with the application of various toxic chemical solutions.

Damaged areas that are frosted, etched or have a satin-type finish can be restored as well. The portion of the piece being rebuilt may require some sort of surface sanding and a dull glaze coating. Additional conditioning may be attained by sandblasting the surface using an airbrush abrasion method. If the design on the restored area is missing, it may be reproduced with a mold cast and then textured by hand using a chemical etching process. Some chemical etching can be duplicated by stencil to ensure exact design detailing.

A restoration specialist is sometimes asked to repair a damaged item and reproduce an exact copy of the item. This might occur when an item has so many cracks in it that a reproduction made with synthetic glass would prove better than the restored item itself. It could also happen when an owner needs a copy of the restored object to complete a set. The

use of synthetic glass is very helpful in the art of restoration. However, as with most things, it does have a few drawbacks. Synthetic glass is not normally as durable as the original glass. Therefore, it should not be used in the same way. Sometimes, harsh cleaning can scratch or cloud synthetic glass. Pieces made or restored with synthetic glass should be handled with care and used for decorative purposes only.

Glass and crystal can be very vulnerable to changes in the environment. Care should be taken to avoid displaying such items in direct sunlight, severe temperature changes, drafty or humid areas, and high traffic areas that create vibrations. Stains can be avoided by not allowing liquids to sit in a glass or crystal container for extended periods of time. The cleaning of expensive glass and crystal should be done by hand. Mild cleaners are always recommended to avoid the accidental loss of gold, metallic or hand-painted designs.

Time, experience, science and the innate talent of the restoration specialist has made it possible to restore damaged glass and crystal that once was thrown away. The next time you have a disaster at your house, get a qualified opinion before you throw the damaged piece away.



Far left: broken rare "stop" tail light of 1920s auto with pieces missing, and restored light, left.

Above: Broken pieces of an antique silver/cranberry serving piece, above, and same piece fully restored, right.

