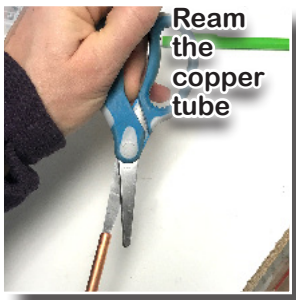
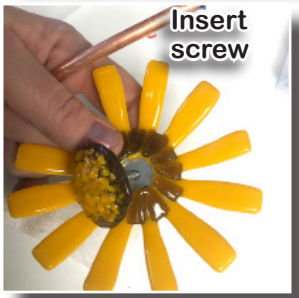
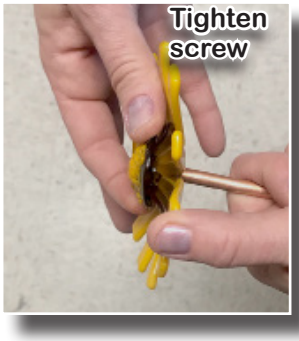
Stemming Flowers Tutorial
(taken from Fused Glass Flowers Book Editon 2)







Several methods can be used to attach fused glass flowers to decorative stems. Most of the flowers shown in in our photographs were attached to copper stems by placing a screw through the hole in the center of the flower into the center of #4-#6 plastic wall anchor seated into a ¼" I.D. copper tube. Due to many variables, the size of the hole in the center of the fused and slumped/draped glass flower may have varied from the ideal size range of 3/16"-1/4". If the hole in the center of the flower was larger then the head of the screw or bolt, a washer was added between the head of the screw or bolt and the glass flower. It may even be necessary to add a washer between the copper tube and the glass flower if the hole in the glass flower was larger than the copper tube. The following table was designed as a general guide for copper tube sizes and the corresponding plastic wall anchors/screws and washers.

Stemming Hardware			
Copper Tube I.D.	Plastic Wall Anchor	Screw Size	Washer
1/4"	#4-#6 x 7/8" or (#6-#8) depending on brand	#6 x 7/8"-1" (tapping screws are ideal)	#6-#8 washer and 1/8" x 5/8" fender washer
3/8"	#8-#10 x 1.25 or #10-#12 depending on brand	#10 x 1-1.25	#10 Flat washer or #10 x 1" O.D. fender washer
1/2"	#10-#14	#10 x 1.5"	#10 flat washer and #10 x 1" O.D. fender washer

The 1/4" copper tubes are surprisingly strong and can hold most fused glass flowers. As the flowers grow in size and weight, the larger copper tubes may be advisable. The basics remain the same regardless of tube size. It may be necessary to use a tool to clear the hole of the copper tube to allow the plastic wall anchor to be seated properly. A great tool for this task is an inexpensive pair of children's scissors.

After the wall anchor is seated into the copper tube, assess the size of the hole in the flower. If necessary, place washers on one or both sides of the hole in the flower. Rubber washers can be placed between the washers and the glass to add stability. Place the screw through any washers and through the hole in the flower and into the wall anchor. Tighten the screw until the flower is held in place, but don't over tighten. A decorative center can be placed over the screw with hot glue or for a more permanent fixative, a 2 part epoxy can be used.

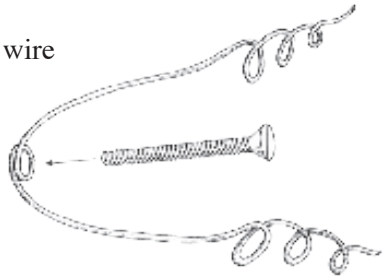
The screw can be epoxied to the decorative flower center prior to placing the screw through the tube. Simply turn the decorative flower center to tighten the screw as shown in the photographs on the left side of this page.

A variety of techniques can be used to disguise the screw in the center of the flower. You can hide the screw with flower centers within the patterns of this book and adhere the centers using epoxy or glue. Decorative items such as glass pebbles, copper sheet, frit or anything that suits your own artistic preferences can be used. Leaving the screw exposed is a viable option as well.

Fine frit shown obscuring the screw in the center of a frit casted flower.

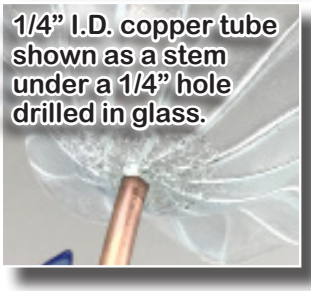
When attaching small flowers, such as the Petunias featured in Figure 13 and the Daffodil in Figure 8 on page 1, to decorative stems, a 1/8" copper tube was used as well as either a 7/16" x ½" upholstery nail or a #17 x ¾" copper weather strip tack. The nail or tack was inserted through the hole in the flower and into the center of the small copper tube. A set of pliers was used to crimp the top of the copper tube in around the nail or tack to help hold the nail or tack into place. In some cases a small washer between the flower and the tube was necessary to keep the flower from sliding down the tube. To create exotic stamens in the center of the flowers as seen in several of the

finished flowers in this book, twist 16 to 20 gauge copper wire as illustrated in the figure at right. The wire wrapped around the screw or in the center of the flower can also serve as a washer to keep the head of the screw from slipping through the hole in the center of the flower. To add another element of delightful sparkle to the flower, a small nugget of glass can be held in the top of the copper wire by wrapping the wire around the glass nugget.

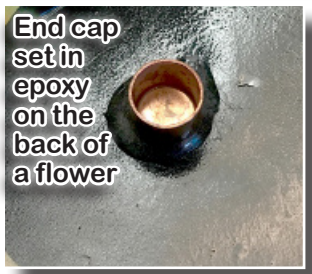


Drilling Holes in Flowers Some of the flowers created using the patterns and instructions in this book will be fused without a center hole. To place these flowers on stems, a hole can be drilled into the glass using a 1/4" diameter diamond crusted core bit and either a hand held drill or a drill press. When drilling holes in glass, you must use water lubrication. In many cases, the center area of the flower can be filled with water as seen in the figure at right. Clay can also be used to create a water tight dam around a center area, or the flower can be submerged in a vessel of water. Take caution not to drill to fast, keep the rpm of the drill at 800 RPM or slower. Approximating the speed of the drill will do if you just think "slow and steady". Do not apply too much downward pressure. Allow the bit to do the work and occasionally back the bit out of the glass to allow optimal water lubrication to the working area of the bit. Do not attempt to drill holes in glass with drill bits that are worn/dull. Replace the drill bits frequently. It is advisable to wear safety glasses when drilling. After the 1/4" hole has been created in the center of the flower, use the tips for stemming flowers found on the previous page. A 1/4" hole works nicely in small and large flowers for copper tubes with a 1/4" inside diameter (I.D.) and larger. The threaded area of screws from #6 to #10 will fit through a 1/4" hole but typically, the head of the screw will not eliminate the need washers (metal or rubber washers can always be added for stability or decorative purposes).


Water filled center


1/4" I.D. copper tube shown as a stem under a 1/4" hole drilled in glass.

To stem flowers that were formed in the firing process without holes and to avoid drilling a hole in the center of the flower, a 2 part epoxy (JB Weld, Gorilla and Harbor Freight Tool brands among others) and end cap, or other hardware can be used. End caps to fit the copper tubes listed in the "Stemming Hardware" table in the previous page, can normally be found in the same department (typically the plumbing department) as the tubes. These end caps can be adhered to the back of the flower and the respective copper tube can be placed in the end cap. Epoxy can be used inside the end cap prior to placing the copper tube if a permanent fit is desired for the stem in the end cap. The fit on many 1/4" copper tube end caps can be a bit loose. Crimp sleeves of size 14-4 can be found in most electrical departments. These crimp sleeves can be epoxied to the back of flowers crimped to fit the 1/4" copper tubes securely. A screw that corresponds to the wall anchor seated in the copper tube can be adhered to the back of a flower and the flower can be turned to set the screw into the wall anchor. A plastic wall anchor can also be adhered to the back of a flower and the wall anchor can be seated into a copper tube. Use the smallest wall anchor that will fit into the tube when using this technique to avoid having to apply too much pressure on the glass to seat the anchor.


End cap set in epoxy on the back of a flower

Before applying a two part epoxy to a nonporous surface such as metal or glass, it is advisable to use an engraver, grinder or diamond pad to create a less smooth surface for the epoxy to adhere to. Take care using a 2 part epoxy and always use the product in a well ventilated area, following the instructions and cautions on the manufacturers packaging. A ring of clay can create a dammed area for the epoxy to be poured into if working on the back of a flower that is convex.


Crimp sleeve set in epoxy on the back of a flower

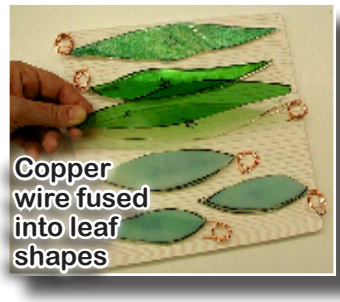
Multi-Part Flowers

Some of the flowers featured in this book such as the Iris, the Daffodil and the Water Lily in figure "multi-part" flowers. A small portion of E6000 adhesive or two part epoxy was applied to the bottom of each draped/slumped section of the flower that was set into place on the subsequent draped/slumped layer of the flower. The holes in the center of the top and bottom parts of the flower, (in the case of the Daffodil and the Iris) were carefully aligned before the adhesive was allowed to set and these flowers were attached to stems using a screw, nail or tack through center hole of the flower.


Grozers used to crimp a crimp sleeve to fit copper tube

Leaves for Flowers

A great way to accent fused glass flowers is to add fused glass leaves to the stems. The leaves can vary in size and shape depending on the flower that they are to accent. To create leaves with copper wires that can be wound around the stems, 16 gauge copper wire was placed between the two matching leaf shaped pieces of glass and the glass was full fused. An abrasive pad or wire brush should be applied to the exposed copper wire to remove oxidized copper before adding the leaf to the stem. Many of the leaves featured in this book exhibit an interesting leaf texture. This textured effect was created with the use of the textured fusing tiles shown on page 38. They were treated with a glass separator and used as a fusing surface beneath the glass. The leaves can be bent into more natural shapes with the use of the GM59 Leaf Slump mold.


Copper wire fused into leaf shapes


Clay dam created to help set wall anchor into epoxy on the convex back of a flower


Screw set in epoxy on the back of a flower