

## **Tutorials – Lead and Copper Foil. What do I need?**

A question we are often asked is which tools and materials are required for someone to start making stained glass objects.

We list below a set of tools that can be used for either lead or copper foil, and also the individual tools and materials required for each method:

Glass Cutter  
Grozing and breaking pliers  
Electric Soldering Iron  
Cutting Oil  
All Nova tool  
Safety Glasses

### **Working with lead:**

Lead  
Tallow (flux for lead)  
Solder  
Leadlight Cement  
Whiting  
Horseshoe Nails  
Lead Knife  
Scrubbing Brush  
Lead



### **Working with copper foil:**

Foil  
Solder  
Safety flux  
Patina  
Small Brush (for flux)



### **A good book for beginners:**

Introduction to Stained Glass

### **Good comprehensive books:**

Quick Success Stained Glass  
How to work in Stained Glass

## **Techniques - Lead v Copper Foil**

There are two techniques available to the artist to hold the glass together - the use of lead came or copper foil.

The lead technique has been used in Europe since Medieval times and is the method by which the windows in your local church will have been made. The lead is either extruded or milled into 'H' sections of different widths called comes, and these

are cut and placed round each piece of glass, then soldered at every joint. This provides the basic structure of the window that, after cementing, will be strong and durable.

Copper foil was first used in the USA by Tiffany, when making some of his marvelous windows but is best known in his lamps. In this case, foil is wrapped around the edge of each individual piece of glass and then a long run of solder (a bead) is melted along all the seams on both sides of the glass. This method allows for great flexibility in design, with the solder providing the foil with its strength.

A detailed description of both techniques follows and, to help you make a decision on the choice of method we suggest you read ahead.

### **Lead**

This is the preferred method when making windows due to the strength offered by the size of the lead, especially after cementing. They also tend to be more weather proof, important if our panels are open to the elements. Terrariums and simple lamps may also be made using lead.

### **Copper Foil**

Most suitable for three-dimensional objects such as lamps, terrariums and boxes. It is also the best technique for window that has many small pieces of glass and will not be exposed to the weather. Accuracy of glass cutting is important with foil.

### **Comparison**

	<b>Lead</b>	<b>Copperfoil</b>
<b>Materials</b>	Lead came – “H” section in 2m length	Foil – 4 widths in rolls of 36 yards
<b>Soldering</b>	“Spot” joints at every place lead meets	Continuous bead along all seams
<b>Glass Cutting</b>	Accurate, but edges are hidden by lead	Accuracy essential or solder will fall through gaps in the joints. A grinder is needed for delicate work
<b>Cementing</b>	Used for weathering only	Not necessary
<b>Finishing</b>	Patina to stain lead black	Patina to stain lead black or copper colour
<b>Uses &amp; Applications</b>	Windows and panels, especially large projects or terrariums, using angled lead and mirror	Windows and panels, 3 dimensional objects such as terrariums, tiffany lamps, boxes, fine intricate work and mirrors