

## Stained Glass Arms of Chelsey of Gloucester Journal

### Overview

This is to document the materials, processes, procedures and techniques used to make the stained glass panel depicting the Arms of Chelsey of Gloucester. The panel is 14" wide by 16" tall. She won the bidding in the fund raiser for Wilhelm and Vienna. The bidding was for a stained glass panel with her Arms.

The panel was built using traditional stained glass techniques (as documented by Theophilus c. 1101) where practical and safe. However, there were hazards in the materials used in the 12<sup>th</sup> century that we, in the 21<sup>st</sup> century, are intelligent enough either not to use or, at the very least, protect ourselves from. These hazards include lead, dusts (lead, glass and copper ashes) as well as costs. Understand that I live in an apartment in a private house and do not have access to outdoor areas on the property. Therefore, the following exceptions were used:

- Glass was purchased, not manufactured (mouth blown) by me. This is because it is beyond my means (financially) to be able to do this myself. However, the glass used was full antique mouth blown glass.
- Lead was purchased, not hand cast. This is due to the hazards of melting lead in my home.
- The pigment used for painting was purchased. This is due to the danger of burning a copper sheet to ashes.
- Modern tools and techniques were used to glaze the panel. This is due to the dangers of starting a coal or wood fire in my house. For example, glass was "cut" by heating a metal rod to red hot then touching it to the glass to get a heat crack.

As I go through the steps taken to build the scroll, I'll give a brief comparison of how the step was performed between the 12<sup>th</sup> and 21<sup>st</sup> centuries.

For a complete description on how a stained glass window was built, please refer to my document [Stained Glass in the Current Middle Ages](#). This paper was published in the [Ars Scientia Orientalis](#), and can be read at <https://conoroceallaigh.wordpress.com> .

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### Materials

#### Lead

The lead for the panel was obtained from DHD metals (Conyers, GA) and is restoration grade. Lead profiles used for the scroll are:

Perimeter	1/2" flat "H"
Background	5/16" flat "H"
Inside Border	5/16" flat "H"
Outside Piping	5/16" flat "H"
Around Shield	3/16" round "H"
Inside Shield	3/16" flat "H"

#### Glass

The panel was made using mouth blown, full antique glass from Lamberts. The glass used was:

Shield	Violet on Clear Flashed (3406V/CL) Medium to Dark Green (2233)
Shells	Pale Amber (43XX)
Background	Violet on Clear Flashed (3406V/CL) Medium to Dark Green (2233)
Piping	Pale Amber (43XX)
Border	Pale Amber (67XX)

#### Paint

The paints used to paint the shells were made from traditional pigments from Reusche.

Tracing Black	DE401
Dark Green	7870MB

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## Processes, Procedures and Techniques

### Cartoons and Patterns

The design process was cut and dry. I have a basic pattern for SCA arms panels. All I need to do is get a copy of the arms, preferably a JPEG file. I then manipulate the picture to fit, as closely as possible, into an 8 x 10 shield.

The patterns were made using modern materials. In the original Middle Ages, the glass artist would take a board that could have two copies of the pattern drawn on it. He would plane the board flat and smooth. When he was satisfied, he sprinkled chalk on the board then rubbed it with a wet rag which created a thin coating on the wood. He would then use a metal tipped stylus to "scratch" the design into the chalk and water coating on the wood. I used paper, markers, pens and pencils. A piece of paper 36 x 48 was easier to find and transport to my workshop than a smooth flat piece of wood of the same size. I would have to make the pattern board by putting together 2 or 3 pieces of wood to get something I could use for this project.

### Cutting the Glass

The glass was cut with a modern glass cutter. This is primarily due to the fact that I don't have access to outdoor areas at home where I could do this as they did in the 12<sup>th</sup> century. In the 12<sup>th</sup> century, the glazier would place the piece of glass to be cut on the pattern board and trace the size and shape with more of the chalk and water mixture. He would heat an iron rod to red hot and touch it to a line on the glass where it needed to be "cut". If a crack didn't appear immediately, he would wet his finger, run it on the line to be cut and reapply the iron bar to create the crack. He may have had to do this several times before he got his crack. For this reason, I used a modern glass cutter with a carbide wheel to cut all the glass.

Glass was purchased, not mouth blown by me. As I stated, I don't have access to outdoor areas so I can't do this at home. Neither do I have access to glass blowing facilities.

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### **Painting and Firing Glass**

After cutting all the glass, I started painting the pieces that needed to be painted. I used traditional stained glass painting techniques. Specifically, the tracing technique was used to paint the detail of the shells in the shield. The pigment used was Reusche Tracing Black (DE-401). The area around the shells had Reusche's Dark Green (7870MB) applied with the matting technique to give the pale amber glass the appearance that is was green on the edges and amber in the middle. All of these techniques, including the way the shells were painted, are the same that were used in the 12<sup>th</sup> century.

The pigment was permanently adhered to the glass by firing the glass to 1250°F.

These techniques and procedures are explained in my document cited above.

### **Glazing (building) the Panel**

This phase was also done using 12<sup>th</sup> century materials, processes, procedures and techniques. The only difference was the tools I used. Tools used for cutting lead, fine tuning the size and shape of a piece of glass, etc. were made of 21<sup>st</sup> century materials.

Soldering was done with a mix of materials, procedures and techniques from both centuries. I used "store bought" solder and lead and an electric soldering iron. I used tallow as my flux. The glass artist in the 12<sup>th</sup> century made, or had made for him; molds for casting his lead came. He would also use these molds to cast his solder. To solder the panel, he would heat another iron bar to red hot and melt solder on a joint with it. All of these activities I defer to the respective manufacturers because they can do this more safely in their manufacturing plants than I can in my house. To facilitate the soldering, a glazier applies a small amount of flux to the joint. Flux is a substance that will clean the joint and help the solder to stick to the joint as well as help it to flow under the lead. The substance that was used way back when was tallow. The Stained Glass Association of America and the British Society of Master Glass Painters both recommend the use of tallow as the flux that should be used in an historic restoration. I always use tallow when I work with lead.

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### **Weather Proofing the Panel**

After the [panel is soldered on both sides, a putty made of linseed oil and whiting powder (calcium carbonate) is pressed between the glass and the lead. This was done to weather proof the stained glass panel in the 12<sup>th</sup> century. Done properly, wind and water (rain and snow) could not penetrate the building through the stained glass window. This was done on both sides of the window. With the use of protective glazing on the outside of the window, weather proofing is moot. However, this step is still performed. Lead is a very soft metal and without proper support could easily allow the window to bend. In addition to weather proofing, the putty was and is used to help stiffen the panel and to prevent the glass from rattling in the lead channel.

### **My Final Step**

The panel is not going into a building as a window. So, in order to make it more presentable, the panel was installed in a custom frame made by my pupil.