



## THE PROCESS INVOLVED IN MAKING THE MEDALS

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### ABSTRACT

*This paper presents a method that was experienced in the laboratory to manufacture a medal. There are three general techniques used to make medals: repoussé, striking and casting. Serigraphy technique is the most chosen for a relief type as it is the fastest and least expensive to produce. The final result is a unique work of art, with examples of the same medal exhibiting subtle variations in color and surface detail.*

KEYWORDS: medals, serigraphy technique

### 1. Introduction

The medal as we know it today had its origins in the Italian Renaissance with the circular bronze commemorative portraits produced by Pisanello (c. 1395-1455) during the mid-fifteenth century. Medals are often viewed in a numismatic context because they share certain obvious characteristics with coins. Both are round, made of metal, and exhibit a portrait on the front (obverse) and an allegorical or narrative scene relating to that portrait on the back (reverse). Medals, however, have no intrinsic value.

They are produced for many purposes: to celebrate famous people, to mark important social or political events, or to memorialize personal milestones, such as births, marriages and deaths.

Until the seventeenth century, medals were often used as articles of personal adornment, attached to clothing or worn around the neck. As intimate sculpture in a double-sided relief format, medals have always been something to hold and turn into hand-personal objects for aesthetic and intellectual contemplation.



*Fig.1. Designed by Pisanello 1447.*



*Fig.2. Aquila city commemorative medal.*

The first great artist to create medals was the Italian painter Antonio Pisano, known as Pisanello, who modeled and cast a number of portrait medals of princes and scholars in the 1440s.

Many other artists followed his example, in Italy, the Low Countries, Germany and France. In the seventeenth century medals were extensively used to commemorate events and glorify rulers. In the eighteenth century prize medals became common. In the 19<sup>th</sup> century art medals became popular.

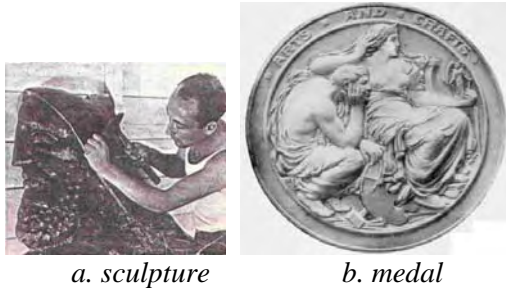
From its contributions in providing jobs and employee skills to delivering the dependable, high-quality and cost-effective components necessary to advance technology, metal casting has impacted virtually every improvement experienced by each passing generation.

### 2. Techniques for making medals

There are three general techniques used to make medals: repoussé, casting and serigraphy.

The repoussé method is a metalworking technique in which a malleable metal is ornamented or shaped by hammering from the reverse side. There are few techniques that offer such diversity of expression

while still being relatively economical. It is also known as embossing. A method of creating a relief design by hammering or pressing the reverse side of a metal surface; literal, meaning in French, "to push back".



**Fig.3.** *Copper repoussé relief.*

The technique of repoussé is the one least frequently employed, although it was used quite widely in the Netherlands during the 17th century. Here the medal is made by hammering a thin shell of a metal blank into a hollow die on which the artist has made a design. The obverse and reverse of the medals, which are made separately, are then soldered together, the resulting medal being hollow. Embossing produces much the same effect but the process is reversed. Here the design is formed by pressing down the background, leaving the design in relief.

The repoussé and chasing techniques utilize the plasticity of metal, forming shapes by degrees. There is no loss of metal in the process, as it is stretched locally and the surface remains continuous.

The process is relatively slow, but a maximum of form is achieved, with one continuous surface of sheet metal of essentially the same thickness. Direct contact of the tools used is usually visible in the result, a condition not always apparent in other techniques,

where all evidence of the working method is eliminated.

### 3. Metal Casting and medals

Casting is considered to be the technique that has produced all of the great medals of the Renaissance period. In this case a model is engraved in relief, usually in wax on a slate disk. The wax model is then removed and molten metal is poured into the resulting matrix. A medallion with two sides would be made by the use of a casting jar, a two-part hollow frame.

Generally, chased medals are considered to be of lesser value as it is assumed that the artist wasn't satisfied with the product as originally made, although one may just as easily conclude that an artist's finishing touches on a work of art improve its quality. This final cast and chased medal may then be used as a model for further castings.

However, whenever a medal is recast in this way the resulting product often has somewhat less definition than the first cast and is always smaller in diameter since metallic objects shrink when cooled. Each time a medal has been recast from medals which have themselves been recast the resulting product not only has still less definition but is also of still smaller diameter. The whole thing starts with an idea, then that idea is translated into words and sketches, photographs and other reference material are also used as guides.

A graphic designer will then render the idea and finally a medal designer produces the final drawing of your medal.

Starting with an already rendered image cuts the design phase short, however the work of our medal designer who produces the final drawing is inevitable.

The model then will be cast in plaster and reduced to the proper size using a special reducing pantograph and will then be used to produce the pressing.



**Fig.4.** *Modeling technique:  
a. mechanical, b. computers, c. manual*

If your medal has a special shape, then a cutting process is necessary. The cutting is a costly process, so unless you have clear reasons, it is recommended to choose a circular shape or standard sizes.

The press utilizes very high pressure to impress upon the blanks a negative motive of the die.

After fixing the top and bottom dies in the minting press, blanks are fed to the press and are stamped on both sides at once. If the medal is required to have a low relief then one strike is enough, however, proof or high relief medals may be struck two or more times.

Different procedures are used to produce different types of medals. The medals can be gold or silver plated. They can be chemically treated (artificially oxidized) to give them an antique appearance, surface polishing may be applied; even hand color-filling may be required.

#### 4. Serigraphy technique

This option is the most chosen for a relief type as it is the fastest and the least expensive to produce.

A 2D black and white design is produced with computer graphics software (fig.4b) where black areas are read as extruded and white areas as embossed.

The final drawing can be used directly to produce the medals. It may need to be turned after collar and press process.

The surface may need to be smoothed as well. Finally, it is heat-treated to harden it. The exact optimum degree of hardness must be achieved in order to avoid cracking under strong pressure while striking.

Specifying the thickness of medal is presented in Figure 5.



Fig.5. Medal with double-sided.

This serigraphy technique is also known as screen-printing or silkscreen. It is a stencil technique that employs fabric stretched tight on a screen support frame. The loops have been blocked on the mesh so that ink does not pass through them. The ink covers everything except for the blocked-out sections and the image appears on the medals.

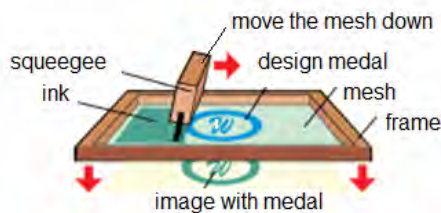


Fig.6. Serigraphy technique.

A screen is made of a piece of porous, finely woven fabric called mesh stretched over a frame of wood (Fig. 7).

Currently most meshes are made of materials such nylon and polyester.

Areas of the screen are blocked off with a non-permeable material to form a stencil, which is a negative of the image to be printed; that is, the open spaces are where the ink will appear.



Fig.7. Applying the ink to the screen.

The screen is placed atop a substrate such as fabric. Ink is placed on top of the screen, and a fill bar (also known as a flood bar) is used to fill the mesh openings with ink.

The process begins with the fill bar at the rear of the screen and behind a reservoir of ink. Moving the mesh down to prevent contact with the sub layer and



then using a slight amount of downward force pulls the fill bar to the front of the screen.

This effectively fills the mesh openings with ink and moves the ink reservoir to the front of the screen.

The ink that is in the mesh opening is pumped or squeezed by capillary action to the substrate in a controlled and prescribed amount, i.e. the wet ink deposit is proportional to the thickness of the mesh and or stencil.

Applying ink to mesh and the screen is lowered and the squeegee is pulled across the screen.

In order to avoid damage to the area that does not have printed image that is the inverse of the border and the next model are covered with the same paint. The medal on one of the sides is introduced in nitric acid. The achievement of care forms can lead to high-quality products.



**Fig.8.** University "Dunarea de Jos" medal

Proof finish beautifully highlights the relief structure. Multiple strikes may be needed to bring out all design details.

## 5. Conclusion

A medal can either be created using the repoussé or cast techniques developed in the classical world and perfected during the Italian Renaissance.

Casting requires the preparation of two original face models, the obverse and the reverse, in wax or plaster.

A graphic designer will then render the idea and finally draw the medals.

One last operation that could mark the clinching of the work, after polishing it, is the application of some paints and lacquers after the chemical attack.

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