



HEMPEL

CREATING A

BRONZE Sculpture

// SARAH HEMPEL IRANI, SCULPTOR

Casting Bronze

An Ancient Tradition

In a world where we have everything at the tip of our fingers-- on-demand movies, Amazon one-click buy-now, door dash, streaming music-- commissioning a bronze sculpture can seem overwhelming.

The work at **Hempel Studios** is a part of a thousands-year-old tradition. The *Riace Bronzes* were cast in 460–450 BC with techniques similar to the ones we use today. Creating a work of art in bronze takes time.

A bronze sculpture is an original work of art, made by human hands that will last for millennia. The quality of the work depends on careful planning and tremendous patience. How does a work of sculpture in bronze come to be?

To Begin: The Consultation

First, consider what you are expressing by having a bronze sculpture commissioned. Is it to remember a person? Celebrate a venerable saint? Express your passion for mythology, history, or equestrian life? What is your vision? In the initial consultation, the artist and client exchange ideas and determine whether or not they are a good fit. Sculpture is a creative expression, but it is also bound by the laws of physics and economics.



The Initial Design

The first step is to design the work at a small scale in clay. This is a collaborative process and changes can easily be made at this size. Once the design is approved, the artist develops a plan with a working budget. The cost is determined by composition, scale, complexity, material, and timeline. A signed contract and a deposit commences the enlargement.

Sculpting in Clay

The first thing is to build an armature in metal, foam, and wood that acts as a skeleton to support the clay. Then the sculptor covers the armature with an oil-based clay called *plastilina*. It never dries out and cannot be placed in a kiln. She articulates every detail of the sculpture using her fingers and modeling tools. Every inch of the surface is touched by the artist's hands. Sculpting a large work can take the better part of a year. Once the sculpture is finished in clay, it can weigh close to 1,000 pounds! Once the clay sculpture is approved, it's time for casting.



Sarah uses wooden tools to sculpt the details of a larger-than-life-size sculpture.

Mold-Making and Casting

Next, a casting crew makes a mold. They coat the entire sculpture in liquid rubber in order to make a negative impression. Then they add a layer of plaster called *the mother mold* that holds the flexible rubber in place. Then the clay is removed and the mold can now be used to make casts. This part of the process generally takes a 2-3 weeks.

2,000 year old
TRADITION

Bronze Casting

At this point in the process, the mold will be brought to the bronze foundry where it will be cast in bronze using the lost wax process. This process takes 6-12 months, depending on the size and complexity of the work.

Wax pouring. Hot wax is poured into the rubber and plaster mold to create an even, uniform wax thickness of only a fraction of an inch. After the wax cools, it is removed from the rubber mold, leaving a highly detailed positive image of the sculpture.

Wax chasing. Using heated tools, the wax team at the foundry repairs any air flaws in the cast ensuring that the wax looks exactly like the clay model. They must fill any air bubbles or holes caused in the casting process.

Spruing. Once the wax chasing is complete, sprues (or wax bars) and a pouring cup are carefully attached to the wax sculpture to ensure the proper flow of



Ceramic Shells coming out of the kiln

molten bronze, allow for gas to escape, and to control the metal solidification.

Making the Shell. The wax sculpture, with sprues attached, is dipped about a dozen times into a porcelain slurry bath. This forms a ceramic shell around and inside the wax sculpture. This becomes the final mold once the wax is “lost” or melts away

The Many Steps of
**BRONZE
CASTING**



Pouring molten bronze into a ceramic shell.

in the kiln. The shells are heated to 1600°F to become hard and for the wax to melt and drain out.

Metal Pouring. The bronze is melted with intense heat and poured from a crucible into the ceramic shells (about 2000°F). It is left to cool and then the ceramic shell is broken off.

Welding. At this point, all the pieces of the sculpture are welded together. If any sprues remain, they are removed. The bronze is then sandblasted to create a clean surface. A great deal of care and artistry goes into this process.

Metal Chasing. The process of metal chasing is to remove the weld marks and replace the texture of the original sculpture. Pneumatic tools as well as hand tools and files are used to restore detail, resulting in an exact representation of the artist's original.

Patina. Working together with the artist, the foundry applies chemicals and heat to the surface of the bronze. This creates the perfect color for the final bronze. Once the desired color is achieved, they stop the chemical reaction by allowing the bronze to cool; and, then apply wax to the surface.

The bronze is now ready for delivery!

Below: Claire McCardell at Dawn in Frederick, MD. Photography by Michael DeMattia

Make your vision
MONUMENTAL



About the Artist

Sarah Hempel Irani has been sculpting expressive figures for over twenty years. Originally from Michigan, she moved to Maryland to apprentice with the former artist-in-residence at the Washington National Cathedral.

Sarah recently installed a 7'6" bronze monument to fashion icon, Claire McCardell, in a city park in Frederick, Maryland. Previously, Our Lady of Mercy Catholic Church in Potomac, Maryland commissioned Sarah to create two larger-than-life-sized sculptures cut from Carrara marble. She articulated the clay sculptures in her studio, then, per Renaissance tradition, she sent the plaster casts to a carving studio in Italy to be carved in stone. The two-ton sculptures were sent back to the US and installed in the sanctuary.

Sarah earned an MA in Medieval and Renaissance Studies from Hood College Graduate School. She is a member of the Association of Consultants for Liturgical Space as well as Christians in the Visual Arts.



Sarah's work has been featured in Women's Wear Daily, Threads, Baltimore Magazine, and several local news stations and magazines. In addition, she has been guest on the *United Lutheran Seminary Explores, Makers & Mystics*, and *Living from the Soul* podcasts.

She works out of her studio in Frederick, Maryland.

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