



Bronze Casting Process

at Adonis Bronze, Alpine, Utah

Armature & Clay Model

- A steel and wire framework is built to hold the clay model.
- Oil-based clay is added over the armature as the original sculpture.



Large Models

- Small clay models are 3D scanned, digitally enlarged, then milled out of foam on a milling machine.



Silicon Rubber Mold

- The clay or foam model is coated in blue silicon rubber to form a mold for the wax.
- The silicon is covered in plaster to help hold its shape.



Wax Pour

- Hot reddish-brown wax is poured into the mold to coat the inside.
- The silicon rubber mold is split in two and removed from the wax.
- The molds are saved for future copies.



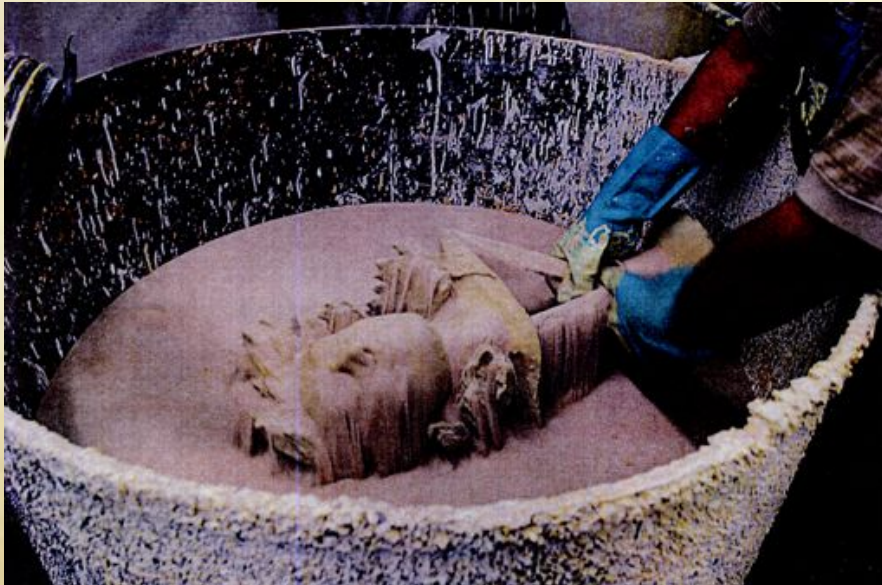
Wax Chase

- The wax figure is repaired and refined.
- A cup and sprues are added to help the hot bronze flow into the mold.



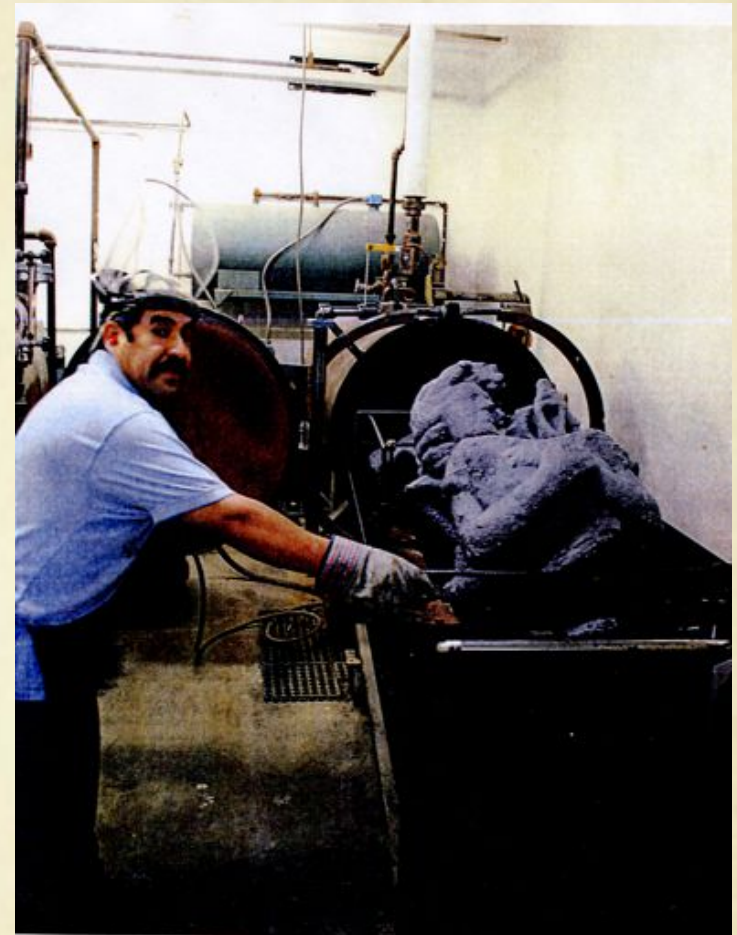
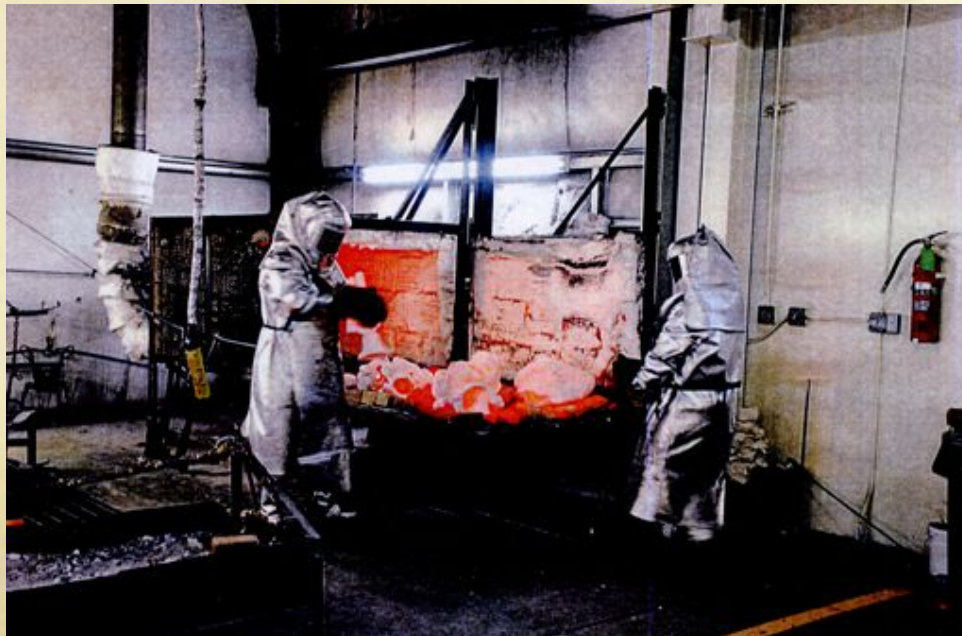
Ceramic Slurry

- The wax positive is dipped in a thin liquid ceramic.
- The wet ceramic is dipped in sand that air is blowing through.
- The sand-coated ceramic is dipped in cement.
- The entire ceramic mold is allowed to dry.



De-Wax and Preheat

- The ceramic and wax mold is placed on a tray in an autoclave and heated so the wax melts out. It is reused.
- The ceramic molds are preheated in a kiln to about 2100° F.



Bronze Pour and Chase

- Molten bronze is poured from a crucible into the mold and allowed to cool.
- The cup and sprues and ceramic mold are removed.



Assembly

- The pieces are welded together.
- Staples are used to attach pieces.
- Rough edges are ground down.



Sandblasting

- The assembled statue is sandblasted to smooth any edges and seams and to create a continuous color.



Patina and Base

- The statue is heated and treated with chemicals to create different colors on the bronze, called a patina.
- The statue is waxed to prevent oxidation.
- A base of wood or marble is attached.



Transportation

- The statue is now complete and ready for shipment or display.



Il Cavallo (The Horse)

- Leonardo da Vinci was employed by the Duke of Milan to build a huge bronze horse in honor of the Duke's father.
- Leonardo sketched horses and drew up plans for a 24 foot tall sculpture. He intended to cast the horse in one pour.



Preparations

- He created a full-sized clay statue as the original mold.
- He also worked on *The Last Supper*, etc.
- He collected the bronze, but it took some time to get enough.



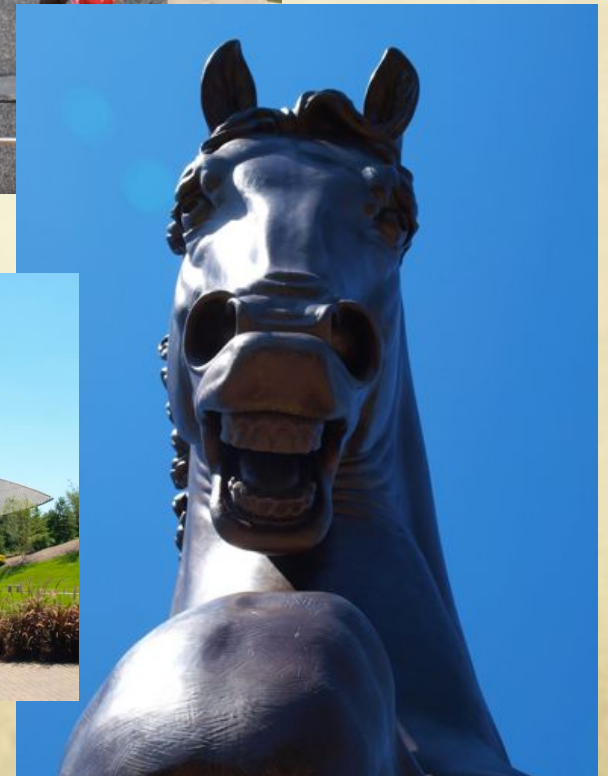
The French Invade

- In 1499, the French attacked Milan.
- The Duke was forced to use the bronze to make cannons.
- The French invaded and used the clay horse for target practice.



The New Horse

- An American airline pilot, Charles Dent from Allentown, PA was also an art collector.
- He heard of Da Vinci's lost horse from a 1977 *National Geographic* article.
- He dedicated his collection and set up a foundation to build the horse.



Completed at Last

- An artist was hired, Nina Akamu, who studied the original sketches and plans and created a new plan.
- Billionaire Frederik Meijer helped finance the project.
- The horse was cast in two full-sized copies and several smaller versions.



Il Cavallo today

- One copy in Grand Rapids, Michigan.
- One copy in Milan at the race track.
- Alternate version done in fiberglass and displayed as a traveling exhibit.

