

CAST

Art and Objects

Made Using Humanity's Most Transformational Process



Jen Townsend & Renée Zettle-Sterling

GLASS CASTING

A History of Innovation

by Susie J. Silbert

Walking into any major glass exhibition, you are likely to encounter a variety of forms of cast glass. From haunting and monumental, like Karen LaMonte's kiln cast dresses, to mysterious and ethereal like Mark Peiser's polychromatic hot cast *Passages*, or ruminative and reflective like Norwood Viviano's *Mining Industries*, cast glass objects inhabit space, work with light, and feature the properties of glass in a way that is all their own. A collection of techniques, modern casting is primarily broken down into two categories, hot casting and kiln casting, broadly defined by the temperature used to carry out the process and the location where it occurs. Within these categories, there is significant room for exploration and innovation, making casting one of the most customizable glass forming processes in use today. Perhaps for that reason, it has been embraced by amateurs and professionals alike who seek a method of working in glass that is flexible enough to accommodate a range of ideas and aesthetics.



Karen LaMonte, *Semi-Reclining Dress Impression with Drapery*, 2005. Cast glass, 3'5" × 2'3" × 3'3".
Photo: Martin Polak, © 2005 Karen LaMonte.

The adaptability of glass casting has also had key implications in the development of the material over time. From the very beginnings of glassworking nearly five thousand years ago to its contemporary moment, casting has been an entry point for new technologies and a means by which glassworkers come to understand their material and imagine new identities for it. In ancient Mesopotamia, for example, casting was one of the very first methods used by early glassworkers looking to apprehend this unprecedented material. Borrowing forming techniques and object types from ceramics and faience, a vitreous material moldable at room temperature, these early glassworkers created amulets and inlay by using molds to stamp forms into softened glass and fusing chips of glass in open faced molds made from clay or steatite.¹

Small, opaque, and brightly colored, the objects early glass casters made not only borrowed technically from other materials, but were intended to emulate the look of other media as well. Without a sense of the range of visual possibilities of glass (for instance, transparency) and without a cultural need for those possibilities, the value of glass came from its ability to successfully mimic precious stone. This was especially true in ancient Egypt. From about 1450 BCE, glass was used in jewelry, furniture, and wall plaques in place of turquoise,

carnelian, and lapis lazuli. These cast items were no mere knockoffs; instead, they were employed alongside precious stones in courtly objects including King Tutankhamen's throne.²

Even centuries later, when glassmakers in Assyria (eighth century BCE) and Persia (fifth to fourth century BCE) discovered how to make impressively transparent glass, they employed the property in service of emulating rock crystal. The highly accomplished vessels they produced in transparent green and colorless glass were formed as stone would be too, using lapidary tools to hollow out and refine cast glass blanks. The practice of using cast glass as a stand-in for rare stones continued throughout the Hellenistic and early Roman periods, with glassworkers producing ever more complex facsimiles as they developed new glass working techniques.

A phenomenal sea change occurred in the meaning, use, and value of glass with the invention of glassblowing and its concurrent improvement in furnace technology between 25 BCE and 25 CE. While ancient glassworkers operated like modern day kiln casters, melting premade billets in low temperature kilns, the advent of glassblowing brought widespread access to molten glass for the first time, revolutionizing the capabilities of the average workshop. Soon, the speedy technique of glassblowing transformed the material from a laboriously produced specialty item available to a relative few into an affordable and ubiquitous aspect of everyday life. Though Roman glassworkers still occasionally created luxury glass, like the incredible fourth-century-CE carved cage cups, blowing soon supplanted other glass forming processes from casting to core forming.

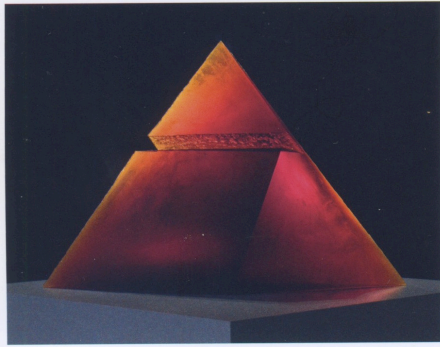


Roman Cage Cup, second half of the fourth century.
Roman, glass.
Photo: Matthias Kabel, Staatliche Antikensammlung
(The State Collections of Antiquities), Munich,
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All expertise associated with casting was not lost, however, as molds became an essential part of glassblowing. By inflating a bubble of glass within a specially-designed blow-mold, glassblowers could shape and decorate their vessels in one quick, reliable step. This innovation was widely adopted and mold-blown glassware spread throughout the Roman and, later, the Islamic world.

For the next one and a half millennia, casting was not a major part of glassmaking. When it did resurface, it was in service of the opulent courts of Louis XIV, whose *Manufacture Royale de Glaces des Miroirs* at St. Gobain used hot casting technology innovated by Italian immigrant Bernard Perrot to create mirrors of unprecedented size. Documented in Diderot's *Encyclopedia*, mirrors of up to nine feet tall and three feet wide were cast by pouring massive amounts of glass onto a metal table and spreading to size with a large roller.³ The industrial applications of casting continued in the early nineteenth century, when American glassworkers created a hand-operated machine for glass pressing. By dropping a gather of hot glass between two bronze dies, pressers could form a vessel and its decoration in record time, making highly ornamented glass cheap, affordable, and abundant for the first time in the modern era.

A few decades later, French artists working out of the ceramic research facilities at Sèvres porcelain developed *pâte-de-verre*, one of the best known and most beloved of all kiln working techniques. Using finely ground glass mixed with a binder into a paste, artists like Henri Cros, Amalric Walters, Argy Rousseau, and François Décorchment, created stunningly detailed multi-colored figurines, vessels, and other small sculptures in the Art Nouveau style. However, despite the popularity of the technique in the late nineteenth and early twentieth centuries, by the 1930s *pâte-de-verre* had gone out of fashion, leaving little indication of the processes used in its manufacture.⁴



Stanislav Libenský and Jaroslava Brychtová, *Red Pyramid*, 1993. Zelezny Brod, Czech Republic, glass, 2'9" × 3'11" × 11".
 Courtesy of Corning Museum of Glass, Collection of The Corning Museum of Glass, Corning, N.Y., Gift of the artists.



Mark Peiser, *Passage #1*, 2012, Hot cast, phase-separated glass, granite base, 23.25" × 8.625" × 25".
 Photo: Steve Mann, Private Collection.



Norwood Viviano, *Mining Industries: Boston* (installation detail), 2015. Rapid prototyped pattern kiln cast glass, fabricated steel, dimensions variable.
 Photo: Tim Thayer/Robert Hensleigh.

The turmoil and prosperity of the postwar period led to critical innovations in the use of both hot and kiln casting in the mid-twentieth century. Some, such as the exuberant deployment of hot casting by designers Bertil Vallien and Erik Höglund from Sweden, and Oiva Toikka from Finland, in the early 1950s and 1960s, were spurred by the fertile environment nurtured by the global studio craft movement. Others, like the monumental, geometric kiln castings developed by Stanislav Libenský and Jaroslava Brychtová in Czechoslovakia beginning in the mid-1950s were a creative response to an overly repressive government. Banned from pursuing abstract art in painting and traditional sculpture, Libenský, Brychtová, and a host of others channeled their ideas through the "minor" art of glass. The large scale castings exploring light, form, and volume they produced in concert with state-run glass foundries continue to be among the most sought after and admired examples of artist-made glass today.

In the United States, despite experiments by Edris Eckhardt in the 1950s and Henry Halem in the early 1970s, casting did not take off in a major way until the early 1980s, almost twenty years after the studio glass movement began. In part, the delay was due to early studio glass emphasis on blowing and the overall lack of adequate glass working equipment in those first years. Nonetheless, by the late 1970s, artists drawn to the narrative and representational possibilities of casting and up for the technical challenges it represented began experimenting with casting in a concerted way. Every decade since then has seen a proliferation of artists interested in the multifarious effects of casting and an expansion of the equipment, glasses, and technical knowledge available to them.

Today, artists cast glass for many of the same reasons that animated its historical use: the desire to replicate objects in alternate media, to apprehend the material's properties, introduce new technologies, and to explore luxury and grandeur of scale. For first-generation studio glass practitioner Mark Peiser, casting is a means to explore the material possibilities of glass and glass chemistry. Composing his own glass formulae, specialized castings furnaces, and mold-making equipment, Peiser has taken innovative approaches to hot casting since 1983.³ For most of the last decade, he has been investigating opal glasses, and specifically, working to master the liminal moment when a striking opal transitions from perfectly clear to totally opaque. By carefully controlling the way the glass is poured as well as the design of the mold, and crucially, the rate at which the piece cools, Peiser is able to make works that are neither fully transparent nor opaque, but rather occupy all points in between and, as a result, appear as if they contain the entire spectrum of color. Only producible by hot casting, and even then, necessitating the continuous stream of a bottom pouring furnace, Peiser's works are both artistic and scientific culminations of a lifelong pursuit of knowledge through casting.

While Peiser has spent the last thirty years developing new technologies within the medium, Norwood Viviano and Daniel Cutrone use casting as a way to introduce new technologies to glass. Fluent in digital media, they each design and produce their mold positives with the assistance of computer-aided tools including CAD software, CNC (computer numerical control) milling machines, and 3-D printing.



Joanna Manousis, *Demeter's Rose*, 2015. Crystal, steel, aluminum, negative core cast crystal, forged steel 4'10" × 4".
Photo: Kenny Ek, Courtesy of Wexler Gallery, Private Collection, Australia.

Casting in all media has long been used to create replicas at a 1:1 scale, but digital tools enable the artists to reproduce large, complex objects in miniature with remarkable accuracy. Both use that capability to its fullest in works that reference geography. Cutrone's *Objects of Desire* series features Mount Everest within a variety of settings. Reflected into a blackened mirror, or tipped on its side within a blown glass capsule, these pieces provoke viewers to reexamine their relationship to the unattainable. In his *Mining Industries* series, Viviano reproduces full segments of cities in three-dimensions in order to examine their industrial past. Overlaid onto maps representing the same area at different points in time, Viviano's cityscapes become a series of lenses alternately occluding and giving access to the history of place.

Channeling the sumptuousness of nineteenth-century *pâte-de-verre* and the monumentality of Louis XIV mirrors, history and memory also animate the works of Karen LaMonte and Joanna Manousis. Harnessing the capabilities of kiln casting to create forms that embody two images at once, these artists employ the transparency and reflectivity of glass to invest found items with an otherworldly significance. Using the lost wax technique, Karen LaMonte creates sculptures of dresses that retain the shape of the body inside them. Elegant and ethereal in transparent glass, these draped dresses stand, sit, and recline like classical sculptures with the figures removed. Haunting and beautiful, LaMonte's pieces are ruminations on the impermanence of life and the endurance of beauty. Employing a similar



Top left Covered Dish in the Shape of the US Battleship *Maine*, ca. 1898. USA, glass, 3.75" × 7.75" × 4.12".
Courtesy of The Brooklyn Museum, Gift of Mrs. William Greig Walker. Brooklyn Museum photograph, 2004, CC-BY.



Top right Robert Bender, *Chips*, 2014. Cast glass, iron oxide transfer, 12" × 10" × 14".
Photo: Robert Bender.

Bottom left Brian Berman, *HOLOS Spiral Peace Portal 216*, 2014, Kiln cast glass, 14" × 4" × 14".
Photo: Brian Berman.

Bottom right Joanna Manousis, *Distilled Portrait I*, 2011. Crystal, mirror, stainless steel, taxidermy magpie, 16" × 6" × 6".
Photo: Joanna Manousis.

