

## HOT GLASS DEMO

# Pressed Into Service: Pressing Studio Glass Art in the US, UK, and China

By Mark Hursty

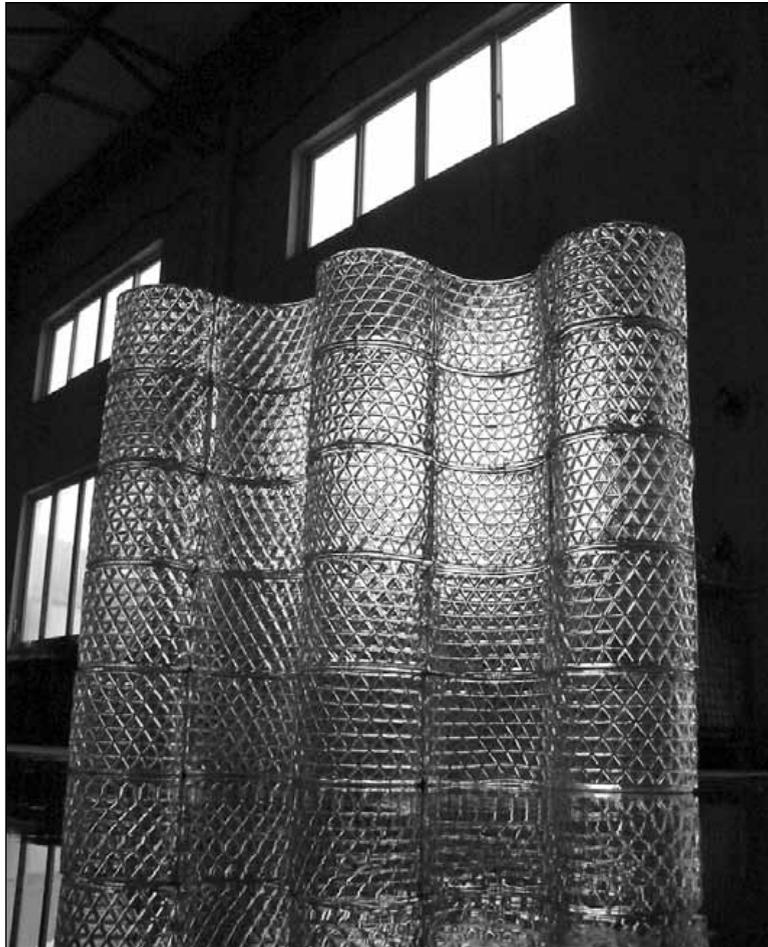
*This paper describes the creative motivations and implications behind my recent research developing experimental, sculptural uses for pressed glass. This work has been informed by my experience in China's nascent glass art institutions as a Fulbright Fellow from 2011-2012, participating in the February 2014 Glass Virus pedagogy forum<sup>1</sup> at Gerrit Rietveld Academie, Netherlands, and my research at the National Glass Centre, University of Sunderland, UK.*

Pressed glass is often perceived as artistically impractical, fit only for the mass production of commercial items like ashtrays, streetlamp covers, and the creatively dubious kitsch-patterned souvenirs. Other artistic deterrents include the heat, tedium, mechanization, manpower, and energy required to produce industrialized pressed glass. Neutral, or even negative, perceptions towards pressing have served to discourage artists from using it in the studio. This misapprehension is unproductive and should be re-examined. The same challenges presented by pressing were overcome by the early Studio Glass artists who were pioneering glassblowing and kiln casting. This begs the question: why couldn't more studio artists use pressed glass?

Pressing glass offers unique creative advantages that blowing and casting cannot, and where the processes overlap, pressing is quicker and cheaper. My research serves as a model for how pressed glass methods can augment and expand the glass artist's toolbox.

### Encouraging Sculptural Motivations for Pressing

In 1990, while I was a RISD undergrad, I glimpsed pressed glass's aesthetic and sculptural potential during my first entry-level glass job on a factory press crew.<sup>2</sup> I was initially intrigued by the performative spectacle of pressing glass: transforming glass instantly from molten to solid and then releasing a sculpted, glowing glass form from the press mold. Importantly, while waiting for these pressings to cool, I realized that they could still be manipulated while retaining their exterior detail. Since then, I have spent years using pressed glass at my own studio<sup>3</sup> in commercially thrifty, utilitarian ways, and exploiting the sculptural potential of the technique.



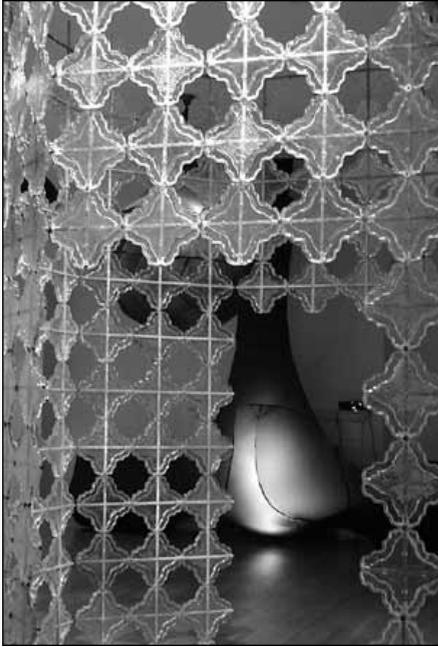
Mark Hursty,  
Shanghai Veil

Similar to clay, the benefits of pressed glass's malleable state are significant and can be expressed in glassblowing terms by relating the pressings to the roll-up process. By flattening glass between molds containing two-sided detail (like a waffle-iron) it is possible to roll them up into cylinders while maintaining high-relief interior and exterior detail. This effect cannot be created with conventional mold-blowing. Because the glass begins in a molten state, the process does not require preheating the way a roll-up typically does. An extension of this technique, described below, combines kilnforming with pressing to create unique forms and color applications that are extremely efficient and could potentially reduce the amount of glass purchased.

Throughout history pressed glass has attracted artists' attention. Artists like Marcel Duchamp and Joseph Cornell used mass-produced pressed glass objects as ready-mades

and multiples. Others have used pressed glass techniques to form simple and decorative sun-catchers and complex architectural structures.<sup>4</sup> My research expands the possibly for artistic approaches to pressed glass. Additionally, my goal is to make the intensive press mold fabrication easier, more intuitive, and ultimately less expensive. To accomplish this I have placed a unique emphasis on practical studio techniques and materials that are compatible with digital design and fabrication methods.

For my hot glass demonstration at the 2014 GAS conference, I pressed the following: components for "galaxies," glass components inspired by Islamic architecture, alternative mold materials, graphite molds based on Chinese glass motifs, and press-molds made entirely of sheet glass. In the following paragraphs, I summarize the technical and theoretical components of each technique.



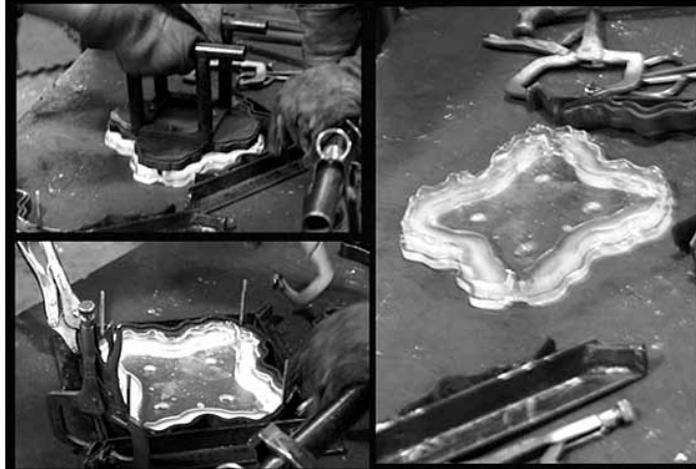
Mark Hursty, *Jali Screen*

### Pressing Galaxies: Miniaturization, Hole Forming and Practical Mold Fabrication

I showed a process for prototyping pressed disks components for miniature “galaxy” chandeliers, a smaller commissioned version of Josiah McElheny’s “Island Universe” sculpture.<sup>5</sup> The commission’s relevant qualities were primarily problem solving: a reduction in scale of the original sculpture, creating uniform glass disks, creating a molten hole forming rather than drilling, and the practical use of sheet metal techniques, rather than impractical industrial milled, cast metal molds.

### Veil Molds: Perforated Screens and Stalactite Vaulting

The following process was used to create an architectural screen comprised on glass multiples covered in stalactite-vaulting forms, or *muqarnas*, inspired by Islamic architecture.<sup>6</sup> This two-part mold process has many advantages and implies further applications, including digital machining for creative pressing. The digitally fabricated components for the mold were waterjet cut then hand fabricated. Using CAD/CAM for the design and manufacture of press-molds resonates with an emerging methodology called Rapid



Mark Hursty, *Jali Pressing Montage*

Tooling (RT). Rapid Tooling is an alternative use of rapid prototyping (RP) and refers to the rapid production of tools and infrastructure for use in manufacturing, rather than simply for prototyping finished objects. Using RT for making pressed glass molds has the potential to be an entry-level process that integrates digital techniques with hot glass work.

A strictly practical feature of this mold is that both the base and the plunger are detailed for pressing pattern into both sides. The base plate detail is retractable and can be adjusted to create variable shapes.<sup>7</sup> Once the glass is pressed in the first mold and has achieved a surface pattern, it can slide onto the secondary shaping mold while it is still hot.

### Paper Molds as Alternative Mold Materials

Next I demonstrated a press mold made from paper and glue, a low-tech alternative to metal. In this case, the paper mold helps form the glass before its final shaping by a secondary mold. The relatively brief contact of molten glass and press-mold shows that some flammable materials can be used for press-molding.

### Celestial Disks and Subterranean Armour: Chinese Funerary use of Pressed Glass for Bi and Burial Garments

Celestial Disks are classical Chinese objects that I reinterpreted using pressed glass. They are particularly significant because they appear to have developed independently

of the Western glass traditions that relied on lead/barium-based glass. During the Han Dynasty (206BCE-220ACE) glass was sometimes used as a substitute for jade. It was also believed to have anti-decaying properties, and was often used in a spiritual context for burial ceremonies. Glass would often take the form of celestial disks known as Bi (Chinese-*玦*) and would make-up burial garments that looked like suits of armour comprised of rectangular pressed glass components.<sup>8</sup>

First, for my reinterpretation of the Bi, I expediently created circular molds for each garment segment by cutting graphite with electrical hand tools. I then demonstrated a technique for making through-holes by creating a form for the molten glass to surround, which was placed into the mold and removed, leaving a hole.

Second, the garment segment I created had a hole in each corner of the rectangle (for threading to other segments), and used mechanical pencil leads formers, inserted into tiny fittings in the mold. Rather than removing them, they were left in the pressed and annealing glass for removal later. The simplicity of pressed glass hole forming belies its importance as a technique that can reduce or eliminate coldworking.

### Compatible Sheet Glass Molds

This mold-pressed glass system demonstrated a practical and creative application of rapid tooling for pressing. In this process, the traditional components of mold, plunger

and finished object are literally fused together. The single-use mold and plunger are made of water-jet cut segments of System 96® sheet glass, which interlock to form an open topped box. Hot glass is poured into the preheated glass box, then pressed using the pre-heated glass plunger, fusing all of these elements (box, hotglass, and plunger) into one object. This new system marks a departure from pressing glass in conventional metal molds. It also has the potential to replace certain kiln-casting and blowing operations while offering new design possibilities for glass sculpture.

The creative implications of this technique are numerous. Because these elements are fused in seconds and can be annealed like blown glasswork, the system could prove to be a quick and efficient substitute for some kiln-forming and casting operations. Because the glass is not surrounded by investment material, the kiln programs are considerably shorter. This technique also offers complex cantilevered and colored details, visual effects unique to this process. This process could also transform traditional kiln-fused roll-ups. Instead of using 100% factory made sheet glass, only enough sheet glass to form the exterior glass-forming box would be required. The rest could be filled by relatively inexpensive compatible furnace glass. This technique also could take advantage of screenprinted decals to embed dimensional imagery in glass. Because the glass “mold” segments are interlocking, with overlapping and penetrating edges, the edges can be emphasized to create details that are difficult to achieve in kiln casting. Alternatively, like a veneer, this process might be used to color the surface of various hot cast objects.

## Conclusion

My intent for the GAS demonstration was to introduce accessible methods of pressing glass to the studio glass community by providing a range of examples adapting pressed glass for practical artistic use. The best way to make pressing more practical is to make the mold fabrication process easier. I approached this by using digital fabrication to make simple molds. The primary way to simplify the mold making process is to create flat press molds with carved detail, and a secondary mold to manipulate the glass while hot to make volumetric shapes. Wherever possible one

should design joinery features in the mold, such as formers for making holes and notches. I demonstrated a series of processes based on these principles in which molds made entirely from fusible sheet glass. I also showed how digital rapid tooling techniques can enable the artist to work creatively with glass pressing.

The advantages of this approach include improved efficiency, and a more streamlined production process compared to blowing, casting, and coldworking processes. This also provides a model for enhancing traditional glass processes using digital manufacture. New technologies like waterjet cutting could enhance design possibilities by mixing digital and manual processes. In this way, the field of creative hot glass can thrive alongside digital manufacturing.

I would like to thank GAS, J.J. Riviello, and West Supply for hosting this demonstration. I also extend a special thanks to Kuhn Vanderstukken and Sheridan College for assisting with the preparations for this demo. I successfully tested these experimental molds for the first time at Sheridan College. An extra thanks goes to Sheridan students Rob Raeside, Kristian Spreen, Stephanie Baness, and Alfred student Chelsea Leung for assisting with this demonstration. Lastly, thank you to my Chinese glass colleagues, Gong Kehai, Jiao Bo, and Liu Shi Jun. We worked together for a year in Shanghai making glass sculptures. Both GAS and I sent them official invitations to attend the Chicago conference, but they were still unable to make the trip.

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**Mark Hursty** – Since he began pressing glass in Sandwich, Massachusetts in 1990, this ancient but artistically maligned manufacturing process has shadowed him. He continued pressing as a student (RISD’93 BFA, Alfred’08 MFA), at his hot shop, Hurstin Studio Glass and Metal (1999-present), as Jacksonville University’s glass program head (2008-10), and in various Chinese university glass programs as a 2011-12 China Fulbright fellow. Currently, he is developing sculptural pressed glass as a researcher at the University of Sunderland’s National Glass Centre, UK. Hursty’s aim in Chicago was to expand and economize Studio Glass’ toolbox by reacquainting GAS participants with ancient and contemporary pressed glass.



Mark Hursty

## NOTES:

1. An international operating platform, dedicated to new strategies in glass art education [www.theglassvirus.tumblr.com](http://www.theglassvirus.tumblr.com)
2. Pairpoint Crystal in Sagamore, MA is a namesake factory that ties, through the Mt. Washington Glass company and the original Pairpoint factory’s press equipment, to Deming Jarves, a glass factory owner and designer who received the first pressed glass patent in 1824 and is best known as an inventor, and later an author, who espoused the use of semi-automated pressed glass equipment. The factory still presses glass using the antique presses.
3. Hurstin Studio Glass and Metal, established 1999 in Hamilton, MA. [www.markhursty.com](http://www.markhursty.com)
4. Dick Marquis, Amy Rueffert, and Amber Cowan each use pressed glass in their sculptures. Frantisek Vizner, a master of pressed glass design emblematic of fine creative pressing in the Czech glass industry, used the aesthetic of pressing in his elaborate cold-worked sculptures. Rene Lalique, known for his Art Nouveau style glass, provides the best-known examples of French creative pressed art glass.
5. Currently, John Lewis, Josiah McElheny, and Elizabeth Kelly are artists who are producing pressed glass for sculptural aims. It should also be noted that Wheaton Arts and Cultural Center in Millville, NJ has pressed glass equipment available for artistic use.
6. I have presented a paper on this process at the 2014 International Symposium of Electronic Art (ISEA) in Dubai.
7. An extension of this telescoping mold technique is a “pin-screen” that is capable of making variable shapes. The term for such a mold is “reconfigurable pin tooling” (RPT), which, as evidenced in Tavs Jorgensen’s slumped glass research is another potential use of rapid manufacturing for shaping glass.
8. Additional use of funerary jade included covers and plugs, and glass substitutes that were inserted in and over the body’s nine orifices to stave off decay in the afterlife.