GLORY HOLE CONSTRUCTION

Michael Mangiafico

GLORY HOLE

- Gas Line
- Multi-Flow Mixer
- Burner Block
- 85 Gallon Drum
- Heat Retention Ring
- Bi-Parting Door (Opposing door not shown)
- Garage Door Wheel
This article presents diagrams and notes for construction of my recently completed glory hole. First an 85 gallon drum was lined with 2300°F fiberfrax blanket. This is to act as an insulating layer. 3 inch 3000°F soft fire brick was used as the hot face refractory. An angle was cut into the bricks lengthwise to create a tighter fit to the circumference of the barrel.

Cutting bricks and working fiberfrax is dusty toxic work, so a respirator and a paper suit were used. It was a sunny (hot!) yet breezy day which allowed the work to be done outside. A radial saw, the motor shielded with a pillow case, was used. Fans were set up to blow in conjunction with the wind and two shop vacuum cleaners were connected to the output of the saw with duct tape so the operating area was relatively dust free. Every other brick of the first circular row was cut in half so a staggered pattern was established going around the barrel.

3000°F fiberfrax blanket could have been used instead of bricks. Bricks were chosen because of cost considerations. Frax will heat up faster, yet bricks tend to hold heat better. At the front of the barrel is a 2 inch thick cast heat retention ring of 3000°F poured castable. Four stainless steel anchors were welded to the drum and thus were embedded within the cast ring to hold it in place. The heat retention ring makes the opening diameter 2 inches smaller than the diameter formed by the brick.

1.5 inch X 1.5 inch X .125 inch angle iron was used for most of the frame of the glory hole. The center of the glory hole is situated exactly 3 feet from the floor. There are two bi-parting doors that were built out of 2 inch X 1 inch X .375 inch C channel. The dimensions of the doors are 24 inches high X 14 inches wide X 2 inches thick. 3000°F fiberfrax board 2 inches thick is used as the refractory. The board slides (tightly) into the C channel which has holes drilled in the back allowing for drywall screws to hold the board in position. This stuff is very spendy! At $80 per square foot it comes in packages of 2 boards each, 2 ft. X 4 ft., which refractory dealers are reluctant to split up. Cast doors would be cheaper to make though perhaps a bit more awkward. The handles were made from coiled round stock.

The track system is top and bottom. The top track is behind the doors so as to stay out of the heat. The largest garage door wheels that could be found were used. The stem of each wheel was threaded to allow them to screw to nuts welded to the door. This allows the clearance of the door and front of the glory hole to be adjustable. Ultimately air cylinders, a solenoid valve and foot switches will be used to open and close the doors. The door systems on both the glory hole and glass furnace were found to be quite involving.

In the side of the glory hole towards the front a square opening was cut. For this a mold was built and the castable rammed in. The mold was then disassembled and the burner block was lifted into place. Fears of it crumbling were unfounded as it slid into place without a glitch. The burner block wedges into place and when fresh is easily worked to conform to the shape of the inside of the glory hole. There is a hole through the center of the burner block which is slightly angled so the flame blows in and will tend to want to spiral to the back of the glory hole. This hole is 1 inch larger than the burner head which mounts inside. This allows for any
expansion. 3000°F fiberfrax is used as a gasket.

A butterfly valve regulates the air flow from a squirrel cage blower. The air is mixed with the natural gas within a multi-flow mixer. The mixer itself is used to regulate the flow of gas. On the floor of the glory hole is a layer of grog which is sort of aggregate of ceramic material. This protects the bricks from little bits of glass that may fall in.

Finding little to no technical literature on glory holes made this project very challenging and thus many areas of the glory hole could be designed and made differently. This particular glory hole was designed to be cost effective and efficient. It is the hope of this author that this letter will offer some insight on what it takes to build a glory hole and perhaps seed some ideas for anyone that is considering this endeavor. Michael Mangiafico Pittsburgh, Pennsylvania

Topics discussed in THE INDEPENDENT GLASSBLOWER are not intended as guaranteed safe or as directions for amateurs to follow. Any discussions are intended for professionals with full knowledge of hazards of materials and proper safety precautions. We cannot assume responsibility for damage resulting from improper use of experimental methods as described herein.

---

**BOOK REVIEW**

BY MURRAY BLOOM

**Color In Glass:** From Biedermeier to Art Deco.

**Vol. I:** Color Schemes-White, Black, Yellow, Green


On the basis of the standardized description above one might be tempted to dismiss this book as being of little interest to the readers of The Independent Glassblower. However, this volume contains nearly 400 recipes for white, black, yellow and green colored glasses! This book definitely should be in the library of every studio glassblower. Before describing the contents let me explain how the book came to be.

In the Technical Museum for Industry and Trade in Vienna there is a glass collection which is the only one of its kind in the world. In 1991 there was an international glass congress in Vienna. The specialized audience of the congress displayed such interest in the collection that the Austrian Government was made aware of this little known treasure. As a result, two years later an exhibit “Magic Color-Color Magic” was held. The volume under review and its companion were prepared to accompany the exhibit. (The companion volume, “Vol. II: Blue, Red, Index:”, which the reviewer has not seen, will probably have about as many pages and illustrations as Vol. I.)

Although The Technical Museum was only founded in the early part of this century, it acquired whole collections from other institutions. Some of these collections were in existence during the Biedermeier Period (around 1820-1840). Consequently, it is not unusual to find, in the caption to a photograph in this book, that the object illustrated was inventoried as early as 1837. Since that time additions to the glass collection have been made, primarily by glass manufacturing companies.

The text of “Color In Glass” is in German but there is a somewhat abbreviated English translation included as a sort of appendix. This translation occupies about 60% of the number of pages used for the German text. The captions for all of the photographs are completely translated and this makes it possible, in some cases to identify a recipe with a particular photograph and thus have a good idea