



LUMINAR GLASS PRODUCTS

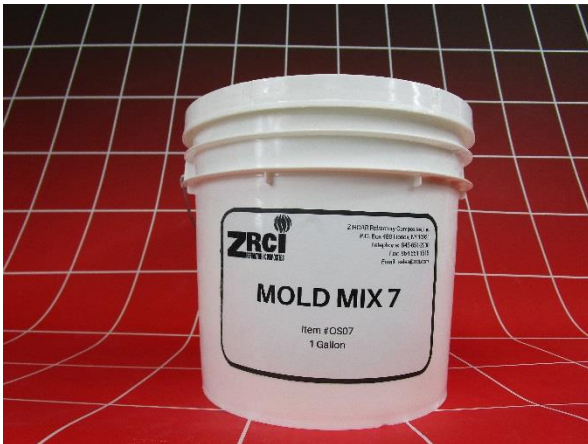
Advanced Materials for Casting, Slumping, and Fusing Glass and Bronze



MOLD MAKING

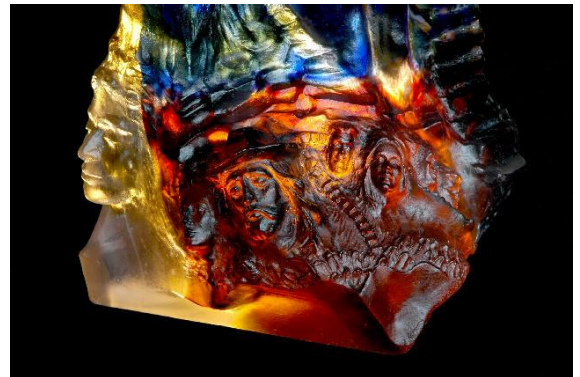
Mold Mix 6

Luminar Mold Mix 6 is a refractory-molding compound designed to allow replication of three-dimensional objects in glass and bronze. It comes as a paste, which is applied to a suitably prepared pattern and hardens upon drying. Properly prepared molds of Mold Mix 6 will resolve the finest details and possess good strength. However, it remains sufficiently friable to permit easy removal after annealing. Mold Mix 6 is highly resistant to reaction with hot glass and gives the fired work a high-quality surface free of hazing is common to investment type molds. Mold Mix 6 may be used for hot casting, kiln casting methods and slumping; all with excellent results. The greatest advantage of Mold Mix 6 is its ease of use and our users guide will show how to use it most effectively.



Mold Mix 7

Luminar Mold Mix 7 is a refractory-molding compound designed to allow the replication of three-dimensional objects in glass and bronze. Mold Mix 7 is sold as a powder and is prepared for use by mixing thoroughly with water until a paste-like consistency is achieved. This paste can then be formed into the desired shape and dried before use. Properly prepared molds of Mold Mix 7 will resolve the finest details and possess good strength. Mold Mix 7 remains sufficiently friable to permit easy removal after annealing. Mold Mix 7 is highly resistant to reaction with hot glass and gives the fired work a high-quality surface free of hazing is common to investment type molds. Mold Mix 7 is composed of high strength alumina fibers and alumina powders. Mold Mix 7 is ideal for use up to 1550°C (2822°F) and above. It will air dry within 48 hours at room temperature or can be force dried with heat. When dried and fired to temperatures above 300°C (572°F), molds made with Mold Mix 7 gain strength and resiliency.



Luminar Silica Grog

Luminar Silica Grog is a high purity granular material made by grinding quality silica solids to a desired mesh size. Grog is a raw material that contains granules of crushed refractory material. Grog is traditionally used to add strength and texture to refractory cements and castables, high temperature molding materials, clay bodies and ceramics. Adding silica grog reduces the shrinkage and warping experienced during drying and firing, allows for even drying, prevents cracking, improves fired abrasion resistance, reduces thermal expansion, reduces density, and adds visual texture. Luminar Silica Grog contains a very high percentage of silica (SiO₂). It is white in color and will withstand temperatures up to approximately 1780°C (3200 °F). Silica Grog is available in a wide range of mesh sizes (mesh size is the number of openings per square inch) for use in various industrial and craft production procedures.



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CERAMIC SHEETS AND SHAPES

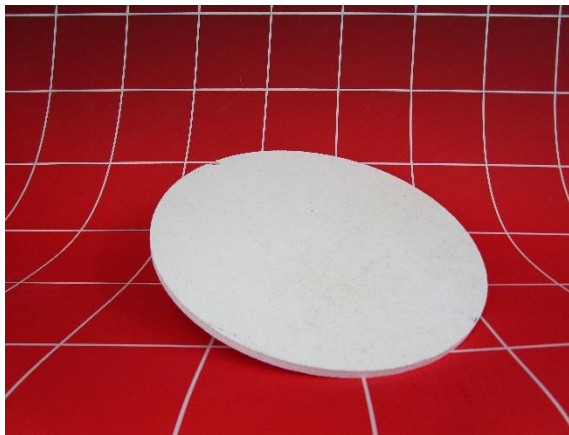
Luminar Alumina Fusing Sheets and Discs

Luminar Alumina Fusing Sheet is a reinforced structural alumina composite material that is a long-lasting alternative to the traditional ceramic kiln furniture. It is ideal for slumping and fusing projects to 860°C (1550°F) without shelf primer. Luminar Fusing Sheets have a smooth burnished surface that typically will not stick to glass. It is lighter than other fully dense kiln shelf materials and allows for rapid heating and cooling cycles without dramatic thermal expansion. Luminar Fusing Sheets can be fired repeatedly (its tan color will turn white on first firing) and can be cut to the desired size with standard saws or other common tools, making it ideal for creating kiln furniture and drop out molds to fit any size kiln. Its high Al_2O_3 content makes it highly resistant to many environments, including molten glass and bronze. To prevent warping or slumping of the sheet when firing heavy loads sheets should be fully supported from below.



Luminar Glass Containment Mold

Luminar Glass Containment Molds are unique molds made from Luminar Fusing Sheet. These rounded rectangular forms are composed of a reinforced structural alumina composite material, heat treated to enhance mechanical and thermal properties. These molds are ideal for slumping and fusing projects to 860°C (1550°F) and can be used up to 1260°C (2300°F) as an electrical and thermal barrier. It has a smooth burnished surface that glass will not stick to. It is lighter than other fully dense kiln shelf materials and allows for rapid heating and cooling cycles. These molds can be fired repeatedly and can be cut to the desired size with standard saws or other common tools. It is available in several depths. Luminar glass containment molds are inorganic, non-flammable and contains no asbestos. Its high Al_2O_3 content makes it highly resistant to many environments, including molten glass and bronze.



Luminar Silica Fusing Sheets

Luminar Silica Fusing Sheets are a low expansion, high strength reinforced silica matrix board. Luminar Silica Fusing Sheets very low thermal expansion coefficient and high hot strength combine to give thermal shock resistance not found in other structural ceramics. These sheets are 100% organic free and contains no refractory ceramic fiber. They are readily machined to precision tolerances with conventional tooling. Luminar Silica Fusing Sheets will last many times longer than any calcium silicate, mica, and asbestos alternatives.



Luminar Low Density Fusing Boards

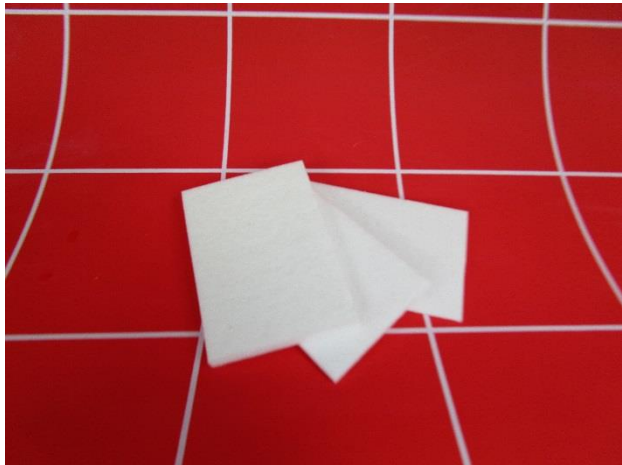
Luminar Low Density Fusing Boards are rigid, high temperature ceramic bodies. They feature excellent insulating performance, good high temperature strength and can be custom designed for a broad range of uses. They are rated for use up to 1260°C (2300°F). They are ideal for light weight kiln furniture and other kiln insulating needs. They are manufactured using alumina and alumina silica fibers and high temperature inorganic binders. These boards are manufactured with a small amount of additional organic binder which increases handling strength. The organic binder will burn out at temperatures between 232°C (450°F) to 316°C (600°F) during initial heat up by the end user.



PAPER AND BLANKETS

Luminar Fiber Shelf Paper

Luminar Fiber Shelf Paper are premium grade, lightweight refractory materials made from high purity alumina-silica fibers. They are ideal for applications up to 1260°C (2300°F). These papers contain long fibers that retain great strength after firing, allowing for repeated use at high temperatures. Luminar Fiber Shelf Paper gives an almost smooth finish to the underside of finished glass. It can be easily cut with either scissors or a utility knife. Several layers can be bonded together with Luminar Alumina Coat to form letters, numbers, or raised geometric shapes to create a high relief design. Used as a wrap for several layers of glass strips or circles, a lightly textured surface can be given to boxes or pedestals. When used as a shelf liner it can be rolled flat before placing on the kiln shelf.



Luminar Moldable Sheet

Luminar Moldable Sheets bring new dimensions to the artist or craftsman work molding and fusing of glass. Lightweight and easy to handle, this product can be used for the making of molds, kiln furniture, high and low relief designs, rings, squares and columns. Easily cut with knife or scissors this alumina sheet adds new creativity to hot glass work. These sheets are a high alumina product composed of high purity alumina reinforced with high-alumina ceramic fibers. They have excellent strength and can be fired repeatedly to 1000°C (1800°F) with no shrinkage. Luminar Moldable Sheets can be molded by quickly wetting with water, shaping to any desired form and re-drying. The moist surface can be indented or carved with a tool to create patterns and textures. Dried piece can be used immediately, requiring no pre-firing or kiln wash



Luminar Moldable Blanket

Luminar Moldable Blankets are tough ceramic fiber reinforced insulation. These blankets are ideally suited for a wide range of high temperature applications such as glass slumping and fusing molds. Luminar Moldable Blanket is received wet and can be easily formed into a wide variety of simple and complex shapes. Drying results in a strong rigid shape that can be re-wet to restore the original moldability. Baking to 300°C (572°F) irreversibly removes the moldability, leaving these blankets unaffected by moisture. Luminar Moldable Blanket can be dried rapidly, either with a torch or by applying directly to a hot furnace, to make quick repairs of cracks in, or to replace missing, refractories.



Luminar Silica Blanket

Luminar Silica Blanket is a high temperature insulation blanket made of mechanically interlocked continuous filament amorphous silica fibers with useful properties to temperatures of 1100°C (2012°F). Luminar Silica Blanket is a strong needled blanket with very good handling properties, making it ideal for blow flameworking and bead making. It is virtually shot free and has high resistance to attack by most chemicals, exceptions include strong bases and hydrofluoric acid. These blankets exhibit thermal shock immunity, thermal conductivity and heat storage in the range of refractory ceramic fiber (RCF) blanket and are useful in many applications where RCF is not desired.



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COATINGS AND RIGIDIZERS

Luminar Boron Nitride Release

Luminar Boron Nitride Release is a high temperature, anti-stick release agent/lubricant for glass forming, hot pressing, super-plastic forming of alloys and melting/casting of non-ferrous metals. Luminar Boron Nitride Release forms a non-wetting, non-reacting layer with molten aluminum and magnesium and their dross. It is available in a paint or as an aerosol. The aerosol allows easy application of uniform, thin layers, and the acetone/alcohol-based carrier assures fast drying. Luminar Boron Nitride Release is useful to temperatures to 1816°C (3300°F) in inert and reducing atmospheres. In vacuum atmospheres, can be used to 1400°C (2552°F) before sublimation, and in oxidizing atmospheres, its use temperature is 1093°C (2000°F).



Luminar Graphite Release

Luminar Graphite Release is a super enhanced graphite aerosol spray that improves graphite's performance as a high-temperature, anti-stick release agent/lubricant that is superior to graphite alone. This Graphite Release has high thermal conductivity and is usable in any environment from room temperature to over 900°C (1652°F) compared to graphite alone which only extends to 400°C (752°F). This convenient spray is solvent based and fast drying. Luminar Graphite Release contains no silicones nor disulfides. Easy to use, this spray is applied like conventional paints using an aerosol can or a brush.



Luminar Alumina Coat

Luminar Alumina Coat is a water solution of high purity alumina. It is an excellent bonding agent for **Luminar Moldable Sheet** and a rigidizer for **Luminar Ceramic Paper**. It can be applied with a brush or sponge or used to saturate cut pieces of **Luminar Ceramic Paper**. These combinations allow for the creation of unique slumping and fusing molds. A light coat of Luminar Alumina Coat diluted with equal parts water should be applied with a nylon brush prior to each firing. Depending on the glass and firing schedule some sticking may occur. Testing of the sheet is recommended before firing a major piece. Should sticking occur a sheet of Luminar Ceramic Paper may be placed on the Luminar Fusing Sheet to act as a parting agent.



Luminar SI-HARD

Luminar SI-HARD is a rigidizing, hardening liquid silica coating. This coating is an alkaline, aqueous dispersion of colloidal silica at 50% concentration. It is used for rigidizing and hardening the surfaces of ceramic textile, papers and blankets. It also is ideal as a coating agent and binder. Luminar SI-HARD is easily applied by brushing, rolling, dipping, sponging or spraying. Coverage depends upon the desired hardness. Drying of treated parts can typically be accomplished at temperatures of 150°C for one hour. Luminar SI-HARD should be stored at temperatures between 5°C (41°F) and 32°C (90°F) to prevent irreversible precipitation of the silica.



MAKING OPEN FACED PRESS MOLD WITH MOLD MIX 6

ZIRCAR Mold Mix 6 is a refractory-molding compound designed to allow replication of three-dimensional objects in glass. It comes as a paste, which is applied to a suitably prepared pattern and hardens upon drying. Properly prepared molds of Mold Mix 6 will resolve the finest details and possess good strength. However, it remains sufficiently pliable to permit easy removal after annealing. Mold Mix 6 is highly resistant to reaction with hot glass and gives the fired work a high-quality surface free of hazing common to investment type molds. Mold Mix 6 may be used for hot casting, kiln casting methods and slumping, all with excellent results. The greatest advantage of Mold Mix 6 is its ease of use. Our User's Manual will show you how to use it most effectively



1. Prepare Your Wax Positive Model.



2. Preparation of Mold Mix 6.



3. Prepare glass twists for decoration.



4. Molds sprayed with dry graphite and placed on copper scrub pads to cushion the mold while pressing molten glass into it.

Mold mix 6 molds are lightweight and thin walled molds, which can be used for repeated pressing. Therefore, you want to make the wax positives thin walled also. The reason for this is, microcrystalline wax expands when heated. If you make the wax model out of solid wax, when you are burning out the wax from the mold mix 6 mold, the wax will expand and may crack the mold. Keep the wax wall thickness to no thicker than 1/4" total. Mold Mix 6 will reproduce incredible detail, so make sure that there are no imperfections in your wax positive. **Remember to have NO undercuts in your open face mold.** Undercuts may trap molten glass and damage the mold.

Using a hand-held mixer, first, mix the Mold Mix 6 in a tall container until it reaches a pourable consistency. **DO NOT ADD WATER.** The agitation will cause the Mold Mix 6 to become runny. Because the mold material is white in color and you apply the Mold Mix 6 in thin even coats to the surface of the wax, use food coloring to dye the Mold Mix 6. Mix up three different colored batches. This allows you to see that you are applying the layers evenly. Put the Mold Mix 6 into airtight containers. This is very important or the Mold Mix 6 will dry out. Using a paintbrush, apply thin layers of Mold Mix 6 and let them dry between coats. Build up thin layers to a total wall thickness of 1/8th inch. You can speed up the drying process by placing the mold in front of a fan. Do not dry the layers with heat, as it will cause the wax positive to melt and it will leach into the mold and cause delamination. When the mold is completely dry, you can start burning out the wax.

To "loosen" or "burn-out" the wax, use DRY HEAT. **DO NOT USE STEAM**, as it will add moisture back into your dry mold. A propane torch is used for this method. You **MUST** burn out your molds outdoors. Place your mold upside down on a steel grate, which is placed on top of a metal garbage can containing some water. Using a propane torch, evenly heat the mold with the flame held at a horizontal angle. The wax will melt out of the mold and float on the water. After the wax is completely melted it the mold will look clean of any residue and will be completely white. If you still see black residue on the mold fire the burned-out mold to 1400°F to completely clean out any residue, making the mold ready to apply kiln wash. Use a kiln wash for glass, as this will prevent the glass from sticking and give your mold a longer life. In your kiln completely dry the moisture out of the kiln wash at 300°F. The last step is to spray the kiln washed mold with Graphite Aerosol Spray.

Important Tip – Spray graphite after every press made with molten glass. This will extend the life of the mold. The artist has been using the same molds for 5 years.



5. Build up molten glass around mandrel that has been dipped in bead release.



6. Adding volume and color to mandrel.



7. Adding more color.



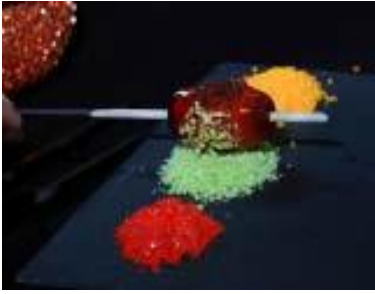
8. Shaping molten glass bead.



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MAKING OPEN FACED PRESS MOLD WITH MOLD MIX 6



9. Rolling and picking up System 96 Uroboros frit.



10. Melting frit in flame.



11. Adding volume for face to frit into mold.



12. Decorating with dots and twists.



13. Adding more dots of color.



14. Using flame to cut glass from rod.



15. Shaping bead with graphite paddle.



16. Final bead shaping then get the bead hot and molten.



17. Quickly lay bead into mold supported with copper scrub pad.



18. Press molten glass into mold.



19. Quickly remove graphite paddles used to press glass or it will chill the glass.



20. Give a light tap to the mold and pull the bead out of the mold.



21. Fire-polish any chill marks caused by graphite paddle. Keep face out of flame. MM6 does not cause chilling, so there is no need to fire-polish the face.



22. Place finished bead into annealing.



23. Flame-working tools and MM6 press mold.



24. Finished Bead.



LUMINAR GLASS PRODUCTS

ZIRCAR's Luminar Glass Products are advanced materials for hot glass slumping and fusing. No other materials are as strong, lightweight, versatile, durable, and easy to use. Our materials are designed to be extremely stable while heated, resist sticking and, in most cases, can be re-used for a number of cast or slumped parts.

**Shop Luminar Glass Products Online at
www.luminarglass.com**