Trade Name
Formglas® QuarryCast®

Common Names
Interior Molded Stone
Simulated Stone Fabrications

Manufacturer
Formglas Products Ltd.
2 Champagne Drive, Suite 200
Toronto, Ontario, Canada M3J 2C5
T: 1.866.635.8030 F: 416.635.6588
Web: formglas.com Email: info@formglas.com

COLUMNS, ARCHES, QUOINS & PEDIMENTS VENETIAN RESORT, MACAU

Summary

QuarryCast® is a gypsum-based composite material resembling natural stone that is factory molded to make an endless array of traditional interior architectural elements, decorative panels with patterns or reliefs, or thin veneers that are an excellent alternative to natural stone due to its light weight, ease of installation, and appreciably lower installed cost. QuarryCast® is available in several standard stone-textured varieties and colors, however, custom colors and textures are commonly formulated to meet specific project requirements. QuarryCast® is a class A fire and smoke rated material.

Detailed Description

QuarryCast® molded stone elements are manufactured with integral color pigments so that the material color extends below the surface. Natural aggregates and minerals are incorporated into a matrix of alpha gypsum cement and glass fiber reinforcement which provides the molded stone elements with added strength and flexibility in addition to an enhanced aesthetic appearance. QuarryCast® molded stone parts often incorporate embedments of steel or wood for added strength and to provide a means for attachment, suspension and stiffening. Yet QuarryCast® parts weigh approximately 3 lb/ft^2 ⇆ 14.6 kg/m^2 depending upon the design and application. As a result, complex architectural shapes can be made with QuarryCast® that otherwise would not be practical to fabricate with natural stone. QuarryCast® requires no heavy equipment for installation, uses less supportive framing, is quicker to install, and less expensive than the traditional alternatives.

QuarryCast® is commonly used to make decorative wall facades and arches; columns, capitals and bases; retail store fronts and displays (using QuarryCast® veneer panels); pilasters and pediments; moldings, light coves and running trim; brackets, corbels and quoins; ceiling offers, domes and vaults; complex geometric shapes, sculpted panels, and many other decorative elements. These elements can be fabricated into virtually any shape or scale yielding intricate surface detail, textures, patterns and choice of color. Subtle texture and color variations may occur within and between parts consistent with that of natural stone materials.

QuarryCast® ceiling elements are usually wire suspended. Most other molded parts are face-fastened with screws through built-in reinforcement, countersunk and filled with a factory-supplied patching compound. Moldings can be supplied with factory-molded corners to streamline installation. Joints are normally caulked or dry-butted, or in some cases (such as column applications), filled with the factory supplied patching compound.

Most items are custom made to project design requirements and specifications. Formglas uses 5-axis CNC technology to machine precision patterns from which molds are produced to make the required parts. In situations involving complex design elements or projects, Formglas will work with Architects and Designers to develop a practical plan for the parts and assemblies they envision through 3D modeling and/or scaled or full size mock-ups. Detailed shop drawings and material samples are prepared for approval prior to manufacture.

© 2013 Formglas
V.13.1

Formglas®, MasterFormat® and LEED® are trademarks of their respective owners.

Technical Data

Refer to the following standards:

ASTM International (ASTM)
- E84 Standard Test Method for Surface Burning Characteristics of Building Materials

International Standards Organization (ISO)
- ISO 1182:2010 Reaction to fire tests of products - Non combustibility Test
- ISO 1716:2010 Reaction to fire tests for products - Determination of the gross heat of combustion (calorific value)

International Maritime Organization (IMO)
- FTP Code (IMO resolution MSC 61/67)

Physical and Mechanical Properties

Formglas uses alpha gypsum materials that are mined and processed in the USA from some of the world's purest deposits (over 99% purity of $CaSO_4 \cdot 2H_2O$). Throughout the fabrication process, the gypsum material is subjected to strict inspection and testing to guarantee its high level of quality. Our prominent gypsum suppliers certify the raw materials are in compliance with the ASTM C1355 Standard.

Matrix:	Alpha Gypsum Cement and various aggregates
Finish:	Standard colors and color matching available.
Surface:	Standard textures and texture matching available.
Factory Finish:	Clear non-gloss sealer
Density:	~100 lb/ft³ ⇆ 1600 kg/m³
Weight: **Veneer panels:** **Molded parts:**	 2-2½ lb/ft² ⇆ 10-12 kg/m²* 2½ -5 lb/ft² ⇆ 12-24 kg/m²*
Veneer thickness:	5/16" ⇆ 8 mm nominal**
Shell thickness:	5/16" ⇆ 8 mm nominal**
Edge thickness:	¾-1¼" ⇆ 19-32 mm typical
Embedments:	Galvanized steel or wood (if required)
Glass Fiber:	5% typical
Max. length moldings:	8' ⇆ 2.4 m
Max. size veneer panels:	48" x 36" ⇆ 1200 x 900 mm
Max. size molded parts:	40 ft² ⇆ 3.7 m²

* Typical weights – parts with deep surface relief, etc. may weigh more.

** Subject to manufacturing tolerances. Weight and measurement conversions may be rounded. Submit drawings for a more accurate estimate.

ASTM and ISO Test Results

Flame Spread:	0
Smoke Development:	5
Behavior at 750°C:	Pass
ISO Reaction to Fire Tests **Mass Loss:** **Temperature Difference:** **Duration of Ignition > 5 sec:**	 20% 2.7°F ⇆ 1.5°C 0
Gross Heat of Combustion:	258 Btu/lb ⇆ 0.6 MJ/kg

Manufacturing Tolerances

Veneer Thickness:	± 1/16" ⇆ 1.5 mm
Dimensional (all directions):	± 1/16" ⇆ 1.5 mm
Bowing, out of plane	3/32"/ft ⇆ 5 mm / 300 mm
Molded Part Thickness:	-1/16 to + 3/16" ⇆ -1.5 to +5 mm
Dimensional (all directions):	± 3/16" ⇆ 5 mm
Bowing, out of plane	3/32"/ft ⇆ 2.5 mm / 300 mm

LEED®

QuarryCast® material needing to contribute to LEED® MR credits must be indicated at the time of bid request. Nominal additional costs may apply.

MR Credit 4: Recycled Content

QuarryCast® parts can be supplied with a minimum of 10% recycled content. The actual amount varies depending on the individual part design and type of reinforcement used. For more information, visit the LEED® information page on the formglas.com website.

Other credits may be available including:

LEED® MR Credit 2.1 and 2.2: Construction Waste Management
LEED® MR Credit 5.1 and 5.2: Regional Materials

Other Classifications and Approvals

In addition to ASTM and ISO Testing, QuarryCast® has been tested at the Centre Scientifique et Technique du Bâtiment (CSTB) in France and is classified "M0". This classification refers to building materials that are non-combustible. QuarryCast® has also been tested by SINTEF, which is the largest independent research organization in Scandinavia and classified as a non-combustible material, in accordance to the IMO A.472 standard. QuarryCast® has also been tested in Germany to DIN EN ISO 1182.

QuarryCast® is approved for use on Cruise ships with Module "B" and "F" Certificates of Approval in accordance with the International Maritime Organization (IMO) and Marine Equipment Directive (MED) regulations.

© 2013 Formglas
V.13.1

Formglas®, MasterFormat® and LEED® are trademarks of their respective owners.

Delivery, Storage and Handling

QuarryCast® parts shall be transported and handled in a manner that avoids damage or excessive stress. Packaging or components showing signs of damage should be marked as such on freight documents, inspected immediately, and claimed for any damage due to shipping with the freight carrier. Advise the carrier and Formglas of any damage immediately. QuarryCast® parts shall be protected from rain, snow, sunlight, excessive weather conditions, high levels of humidity, and job site damage. To prevent distortion, warping, and other physical damage, QuarryCast® parts shall be kept clean and stored on a dry surface and not stacked or leaned on each other. Use clean gloves as required to ensure oils, adhesive and other contaminants are not transferred onto the pre-finished surface.

Preparatory Work

Do not deliver or install QuarryCast® parts until the building is enclosed and weatherproof, wet work is complete, and the HVAC system maintains temperature and humidity at normal occupancy levels. Acclimatize QuarryCast® parts for a minimum of 48 hours to the ambient temperature and humidity levels of spaces in which they are to be installed. It is the Installing contractor's responsibility to order the correct material quantities (including a waste allowance) and verify the field dimensions and conditions for inclusion into the shop drawings.

Site Conditions:

Review the site conditions for compliance with Formglas' requirements relating to environmental conditions, installation tolerances and any other conditions that may affect the installation and performance of QuarryCast® parts. Any unsatisfactory conditions are to be corrected prior to installation. Field measurements are to be taken to verify the dimensions, including those not shown on the drawings, and provide specific details of any changes for inclusion into the Formglas shop drawings prior to it commencing the manufacture of custom molds and QuarryCast® parts. Formglas will produce parts in accordance with the approved shop drawings only, and is NOT responsible for any deviations between the site conditions and the approved drawings.

Substrates:

The framing and/or substrates to accept QuarryCast® parts shall be surfaced with suitable materials (e.g. plywood for veneer or flat surface solutions) and installed straight and true within 1/8" in 8 linear ft. ⇆ 3 mm in 2500 mm and shall be free of obstruction and interference that prevents the correct positioning and attachment of the QuarryCast® parts. Metal framing members shall be of the proper size and design for the intended use and shall be sufficient to properly support the installed QuarryCast® parts. Metal framing members shall be installed in accordance with ASTM Standards C754 or C1007, as required. The location and incorporation of control joints is determined by the architect.

Installer Safety

Installers are to wear appropriate personal protection equipment when handling or installing Formglas materials. This should include eye protection, gloves and dust masks. Please adhere to local regulations and rules established at the job site. Before handling and installing Formglas materials, installers are responsible for reviewing MSDS information which is readily available at www.formglas.com, or included with the crate(s) used to ship Formglas materials, or by calling Formglas at 1.866.635.8030.

Installation

General:

Install QuarryCast® parts as indicated on the approved shop drawings, instructions and the contract documents. The installing contractor is to supply and install all brackets, and shims for the installation and proper alignment of the QuarryCast® parts with adjacent parts and materials. Part thicknesses may vary per manufacturing tolerances. Allow for shim spaces between the QuarryCast® and the substrate. Attach the molded stone parts to substrates and framing with screws or other fasteners as shown on the shop drawings. Additional bracing, fastening points etc. not shown on the drawings, may be required to ensure a proper installation. Where QuarryCast® parts are suspended, use all the suspension points indicated on the shop drawings or on the back of QuarryCast® parts as a minimum requirement, and use additional support(s) as required. Columns, large parts and moldings etc. are to be face fastened with countersunk screws. After, the screw holes are to be filled with Formglas supplied patching compound. Where QuarryCast® veneer panels are adhered to surfaces, use a nail gun with 18 guage nails and a Formglas recommended brand adhesive only (e.g. PL400). See Installation Instructions for more complete details.

Cutting:

When QuarryCast® parts require cutting, use the most suitable cutting method listed below. If circumstances allow, cut parts outdoors or in a well ventilated area. Always wear goggles and a dust mask.

- A miter or table saw with a diamond cutting blade (e.g. 12" ⇆ 305 mm). Carbide blades with 80+ teeth work well but dull quicker.
- For irregular cuts use a reciprocating saw, such as a jig saw, with tungsten carbide blades.
- For small cutting operations a mini grinder with a 4" ⇆ 100 mm diamond blade can be used.

© 2013 Formglas

Formglas®, MasterFormat® and LEED® are trademarks of their respective owners.

Edge Finishing after Cutting:

For moldings, columns, and other molded components, lightly sand cut edges with a sanding block or mini sander with #40 - #80 grit sanding sheets or discs.

For veneer panels, use a sanding block with #40 - #80 grit sandpaper to produce a 45° bevel to match the edges supplied direct from the factory.

Attachment:

For moldings, columns and other molded components, face fasten with screws. Pre-drill with carbide bits and countersink holes approx. 1/8" ⇆ 3 mm below the surface along the embedded reinforcement and secure with #8 or similar screws 16" ⇆ 400 mm on center. Refer to the shop drawings for specific details and the location of the reinforcement materials. Screw holes are to be filled afterward with Formglas supplied patching compound. Use joint spacers to maintain a uniform joint spacing of 1/8" ⇆ 3 mm.

For veneer panels, apply walnut sized dabs of a Formglas recommended adhesive (e.g. PL400) on the panel back approx. 9" ⇆ 225 mm on center and slide into position. Keep adhesive back from panel edges to prevent the adhesive from being squeezed onto visible surfaces (remove any adhesive immediately from the face of QuarryCast® parts). To hold the panels in position until the adhesive sets, use a nail gun with 18 guage nails (plywood is the preferred substrate for this reason).

Joint Treatments:

For Dry Joints:

- For veneer panels, butt the QuarryCast® parts and leave the joints dry. Not recommended for columns, cornices or trims.

For Caulked Joints:

- Formglas does not supply caulk for joints but can recommend a brand and color of caulk for use with specific QuarryCast® colors.
- Use spacers to maintain a uniform gap of approx. 1/8" [3mm] and apply masking tape on each side of the joint. Do not use wide joints.
- Avoid smearing caulk beyond the joint - remove any excess immediately with flexible scraper.
- Veneer panels may have dry joints, open joints with accents strips (e.g. metal or laminate), or caulked joints.
- Caulk between QuarryCast® and different materials.
- Do NOT attempt a monolithic look - joints can not be hidden.

Hole Filling and Patching:

- Hole Filling: Finger fill screw holes with matching QuarryCast® patching compound avoiding smearing it beyond the hole. Remove excess compound immediately with a flexible scraper. The compound will blend in after 24 hours.
- Cracks or Chips: Treat as screw holes (above).
- Minor Scratches and Gouges: Due to the QuarryCast® texture, minor damage usually does not detract from the general appearance.

Always use patching compound sparingly

Avoid smearing compound beyond the holes

Always remove excess compound immediately

Note: Refer to the QuarryCast® Installation Instructions for more complete details.

Cleaning and Maintenance

- QuarryCast® has a factory applied clear acrylic sealer to reduce staining and make cleaning easier.
- Clean QuarryCast® parts with a water/soap solution and rinse with clean water and a sponge.
- Excessive dirt, pencil and rubber marks etc. can usually be removed with a multi-purpose spray cleaner such as "Spray Nine®" and wiping after with a damp cloth. Do not use powdered cleansers.

© 2013 Formglas

Formglas®, MasterFormat® and LEED® are trademarks of their respective owners.

Applications

To view photos of Formglas QuarryCast® applications, or to contact a local Formglas representative, visit www.formglas.com.

SCULPTED COLUMNS, DOME & MOLDINGS — ATLANTIS, DUBAI

COLUMNS, ENTRANCEWAYS, MOLDINGS — FALLSVIEW CASINO, ONTARIO

VENEER PANELS — H&M STORES, CANADA

DECORATIVE WALL PANELS — WYNN CASINO AND SPA, NEVADA

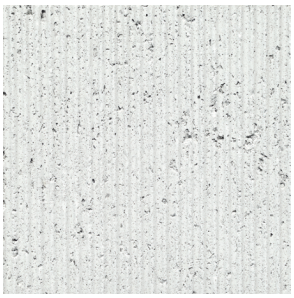
Formglas®, MasterFormat® and LEED® are trademarks of their respective owners.

Samples Available

Below are twelve samples and textures Formglas offers, to demonstrate QuarryCast® in various finishes and surfaces. We maintain an inventory of these and samples can be requested by email to either your local Formglas representative, or directly to samples@formglas.com.

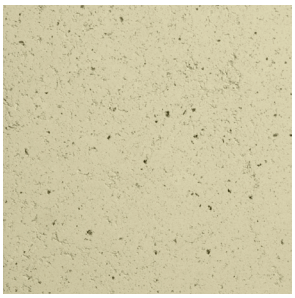
Formglas is able to **custom formulate** QuarryCast® material to match an array of colors, textures or finishes. Please contact your local sales representative to learn more or discuss custom requirements for a specific project.

Please note that colors shown on your display or printer output may NOT be an accurate representation of the actual product.



Formglas QuarryCast®
Finish: White Glitter
Surface: Striated
Sample Size: 3" x 3"
Sample Code: 98105

Formglas QuarryCast®
Finish: Beach Beige
Surface: Stuc Pierre
Sample Size: 3" x 3"
Sample Code: 98106



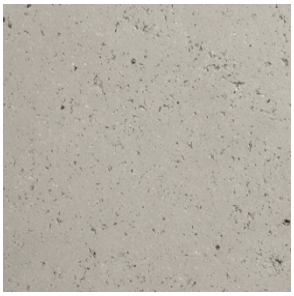
Formglas QuarryCast®
Finish: Seattle Sand
Surface: Standard
Sample Size: 4" x 5"
Sample Code: 98004

Formglas QuarryCast®
Finish: Boise Buff
Surface: Standard
Sample Size: 4" x 5"
Sample Code: 98005

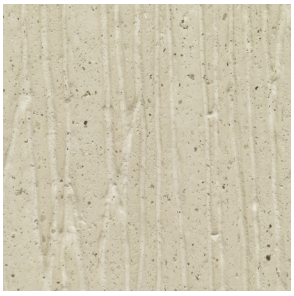
Formglas QuarryCast®
Finish: Coffee
Surface: Coral
Sample Size: 3" x 3"
Sample Code: 98107

Formglas QuarryCast®
Finish: Terracotta
Surface: Sandblasted
Sample Size: 3" x 3"
Sample Code: 98108

Formglas QuarryCast®
Finish: Kyoto Coffee
Surface: Standard
Sample Size: 4" x 5"
Sample Code: 98006

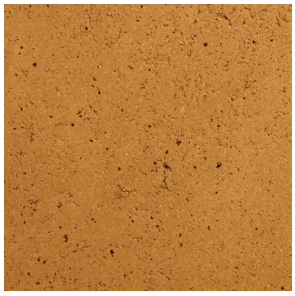


Formglas QuarryCast®
Finish: Galveston Grey
Surface: Standard
Sample Size: 4" x 5"
Sample Code: 98007

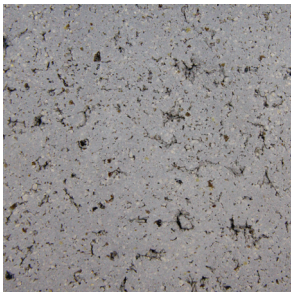


Formglas QuarryCast®
Finish: Beige
Surface: Raked
Sample Size: 3" x 3"
Sample Code: 98109

Formglas QuarryCast®
Finish: Boise Buff
Surface: Impact
Sample Size: 3" x 3"
Sample Code: 98120



Formglas QuarryCast®
Finish: Canyon Clay
Surface: Standard
Sample Size: 4" x 5"
Sample Code: 98009



Formglas QuarryCast®
Finish: Mountain Grey
Surface: Standard
Sample Size: 4" x 5"
Sample Code: 98013

© 2013 Formglas
V.13.1

Formglas®, MasterFormat® and LEED® are trademarks of their respective owners.