Trade Name
Formglas® MetalCast®

Common Names
Cold Cast Metal

Manufacturer
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COPPER BRICK-PATTERNED VENEER PANELS CREDIT SUISSE, FLORIDA

Summary

MetalCast® is a proprietary cold cast metal material made with real metal powders incorporated into a composite with glass fiber reinforced gypsum. This metal composite is cast into shapes, without the application of heat, by placing the material into molds in a hand lay-up process. After removal from the molds, parts are buffed to a lustrous sheen and coated with a protective lacquer to reduce oxidation. The bronze, copper, brass, nickel silver and white metal elements are for interior use only and are custom manufactured into virtually any shape with precise detail. MetalCast® is a premium product but is usually more economical than using conventional metal castings.

Detailed Description

MetalCast® elements are typically used to provide rich decorative embellishments for interior applications. MetalCast® is used to make complete architectural elements, but also frequently used as trim, inlays and appliques to enhance other materials. The molded parts have a shell thickness of approximately 1/4" ⇆ 6 mm and weigh 2.5 to 4 lbs/ft.^{2} ⇆ 12 to 20 kgs/m^2.

MetalCast® parts often incorporate embedments of steel or wood to add strength and provide a means for attachment, suspension and stiffening. As a result, complex architectural shapes can be made with MetalCast® which would be otherwise impractical or cost prohibitive to produce with conventional metal castings. In most instances, MetalCast® elements require less support framing for their installation and offer a more economical solution than conventional metal castings.

Typical architectural applications of MetalCast® include: moldings, trim and light coves; pediments and pilasters; capitals; appliques, plaques and inlays; decorative frames and displays; and other decorative elements. Ideally, components are reserved for installations at or higher than 3ft ⇆ 900 mm AFF to reduce the potential for scuffs or scratches which cannot be easily repaired. All of the aforementioned items can be molded into shapes yielding fine surface detail, textures, patterns and choice of metal finishes. Shade and brightness variations will occur within and between parts. MetalCast® should not be used where it is subjected to mechanical abuse, water or high levels of humidity.

MetalCast® molded parts are to be installed with concealed fasteners and/or adhesive wherever possible. Parts other than veneer panels are made with built-in reinforcement for attachment purposes. Moldings are typically supplied with factory-molded corners but can be cut on site and mitered with sharp, 80+ teeth carbide blades.

Most MetalCast® items are custom made to meet 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 are prepared for approval prior to manufacture. MetalCast® interior elements have been used in numerous world class buildings around the globe.

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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 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

The metal powders used in MetalCast® are highly refined and also used in powder metallurgy parts production. The alpha gypsum cement materials used as the matrix are mined and processed in the USA from some of the world's purest deposits (over 99% purity of CaSO4·2H2O). Our prominent gypsum suppliers certify the raw materials are in compliance with the ASTM C1355 Standard.

Matrix:	Metal and Gypsum Cement
Finish:	Bronze, Copper, Brass, Nickel Silver, White Metal
Surface:	Standard textures and texture matching available.
Factory Finish:	Clear non-gloss lacquer
Density:	120 lbs/ft.^{3} ⇆ 1920 kg/m^3
Weight: **Veneer panels:** **Molded parts:**	 2.5-3 lbs/ft^2 ⇆ 12-15 kg/m^{2*} 2.5-4 lbs/ft^2 ⇆ 12-20 kg/ m^{2*}
Veneer thickness:	1/4" ⇆ 6 mm nominal**
Shell thickness:	1/4" ⇆ 6 mm nominal**
Edge thickness:	¾-1¼" ⇆ 19-32 mm typical
Embedments:	Galvanized steel or wood (if required)
Glass Fiber:	5% typical
Max. length moldings:	4' ⇆ 1.2 m
Max. size veneer panels:	48" x 36" ⇆ 1200 x 900 mm
Max. size molded parts:	20 ft^2 ⇆ 1.8 m^2

* Typical weights – parts with deep surface relief, etc. may weigh more. Submit drawings for a more accurate estimate.

** Subject to manufacturing tolerances. Weight and measurement conversions may be rounded.

ASTM and ISO Test Results

Flame Spread:	0
Smoke Development:	≤10
Behavior at 750°C:	Pass
ISO Reaction to Fire Tests **Temperature Difference:** **Duration of Ignition > 5 sec:**	 2.7°F ⇆ 1.5°C 0
Gross Heat of Combustion:	378 Btu/lb ⇆ 0.9 MJ/kg

Manufacturing Tolerances

Veneer Thickness:	± 1/16" ⇆ 1.5mm
Dimensional (all directions):	± 1/16" ⇆ 1.5mm
Bowing, out of plane	3/32"/ft ⇆ 2.5mm/300mm
Molded Part Thickness:	-1/16 to + 3/16" ⇆ -1.5 to +5 mm
Dimensional (all directions):	± 3/16" ⇆ 5 mm
Bowing, out of plane	1/8"/ft ⇆ 3 mm / 300 mm

LEED®

Any parts needing to contribute to LEED® MR credits must be indicated as such at the time of bid request. Additional costs may apply.

MR Credit 4: Recycled Content

Most MetalCast® parts can be supplied with a minimum of 10% recycled content. The actual amount varies depending on the type of metal and 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, MetalCast® 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. MetalCast® has also been tested to the German Standard DIN 4102-1 and classified as an A2 non-combustible material.

MetalCast® 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.

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Delivery, Storage and Handling

MetalCast® 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. MetalCast® 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, MetalCast® parts shall be kept clean and stored on a dry surface, in a dry area, and not stacked or leaned on each other. Parts should be handled with clean gloves to ensure that oils, adhesive, and other contaminants are not transferred onto the parts. **Failure to observe delivery, storage and handling instructions may result in irreparable damage.**

Preparatory Work

Do not deliver or install MetalCast® 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 MetalCast® 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 MetalCast® 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 MetalCast® 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:

In the case of flat veneer surface cladding solutions only, the substrates to accept MetalCast® parts shall be surfaced with drywall or plywood (preferred) that is installed straight and true within 1/8" in 8 linear ft. ⇆ 3 mm in 2500 mm. This is not required for columns, cornices, friezes or other such applications. The substrate shall be free of obstructions and interference that prevents the correct positioning and attachment of the MetalCast® 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 MetalCast® parts.

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 MetalCast® 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 as required for the installation and proper alignment of the MetalCast® parts with adjacent parts and materials. Part thicknesses may vary. Allow for shim spaces between the MetalCast® parts and the substrate. Attach the molded metal parts to substrates and framing with concealed fasteners wherever possible, 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 MetalCast® parts are suspended, use all the suspension points indicated on the shop drawings or on the back of MetalCast® parts as a minimum requirement, and use additional support(s) if required. The use of factory made corners is recommended to avoid field mitering. Where MetalCast® veneer panels are adhered to surfaces - use a Formglas recommended brand adhesive only (e.g. PL400) marketed under Loctite and LePage brand names.

MetalCast® is not as impact or scratch resistant as stainless steel and is therefore not suitable for baseboards or other areas subject to wear or abuse.

Cutting:

When MetalCast® parts require cutting, follow the method detailed below. If circumstances allow, cut parts outdoors or in a well ventilated area. Always wear goggles and a dust mask.

- When factory made corners are not supplied, use a miter or table saw with sharp carbide blades with 80+ teeth.
- Test-cut parts first. Cutting should be done very slowly and carefully.
- Apply "painter's" masking tape only over the area to be cut. Cut face-up to avoid chipping and remove the tape

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immediately afterward. **Remove the tape by pulling it toward the cut edge (not away from it) to avoid peeling off the lacquer coating.**

Attachment:

For moldings, columns, other parts, wherever possible, MetalCast® is to be installed with concealed fastening methods. If face fastening is necessary, plan in advance to either use MetalCast® matching screw covers or patching compound. **Note: The patching compound will always be noticeable.** Pre-drill countersunk holes evenly spaced apart and secure with #8 or similar screws along embedded reinforcement. Refer to the shop drawings for specific details and the location of the reinforcement materials.

Where possible, position screw holes where they will be inconspicuous. Use a Formglas recommended construction adhesive (e.g. PL 400) to minimize the number of face fasteners.

For veneer panels, apply walnut sized dabs of adhesive on the panel back approx. 9" ⇆ 225 mm o.c. and slide into position. Keep adhesive back from panel edges to prevent the adhesive from being squeezed onto visible surfaces. A hot-melt adhesive can be used **in conjunction** with construction adhesive to provide a quick bond. Apply a few spots of quick-set hot-melt adhesive near the corners, or where required, just before installation and press panel into place. Use joint spacers between parts to maintain a uniform joint spacing of 1/16" ⇆ 1.5 mm.

Adhesive:

Use a Formglas recommended brand adhesive to prevent the possibility of bleed-through (e.g.PL400) marketed under Loctite and LePage brand names. Take precautions to keep the adhesive off the face of the MetalCast® parts – remove any adhesive immediately.

Joint Treatments:

For Caulked Joints:

- Joints are to be 1/16" ⇆ 1.5 mm wide and caulked. Exact caulk matches are not available. Formglas does not supply caulk but can recommend a specific type and color. Never use MetalCast® patching compound in the joints.
- Do NOT attempt a monolithic look - joints cannot be hidden.
- Caulk between MetalCast® and different materials.

Hole Filling and Patching:

- Fill holes with (two part) MetalCast® patching compound (refer to the patching instructions).
- Hole Filling: Patch screw holes carefully with matching compound. Take precautions to avoid smearing it beyond the hole. Remove excess patching compound immediately with a flexible scraper or damp cloth.
- **Note: Patched holes cannot be polished or lacquered to blend in and will always be noticeable.**

Always use patching compound sparingly

Avoid smearing compound beyond the holes

Always remove excess compound immediately

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

Cleaning and Maintenance

- MetalCast® has a factory applied clear lacquer to reduce oxidation.
- Surface dirt, fingerprints and water stains can be removed with a clean, damp, soft cloth and gently wiped dry.
- Do not use any type of household or solvent based cleaners or abrasives. USE MILD SOAP AND WATER ONLY.
- Similar to actual bronze or brass castings etc., superficial scratches on the protective lacquer will not detract from the overall appearance, but severe damage cannot be repaired.
- Field polishing is not possible because of the lacquer coating required to reduce oxidation.

Note: Once damaged, the surface can not be restored to its original appearance and repairs CANNOT be blended in to match the surrounding surface.

Applications

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

COLUMNS WITH QUARRYCAST® MOSAIC TILE INLAYS CONESTOGA MALL, ONTARIO

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CEILING BEAMS AND COLUMNS — ONE FREEDOM SQ, VIRGINIA

SCULPTED COLUMNS AND CAPITALS — ATLANTIS, DUBAI

CEILING BEAMS AND BRACKETS — CORPORATE LOBBY, DC

DECORATIVE GRILLES — PRIVATE THEATRE BY TK THEATERS

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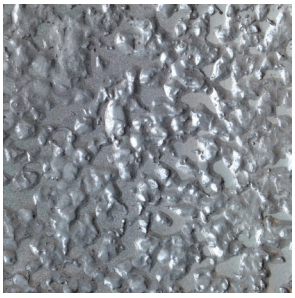
PILASTERS, MOLDINGS, TRIM — BOMBAY COMPANY, USA

Samples Available

Below are seven samples representing Formglas' five standard MetalCast® color offerings to help designers and specifiers better appreciate the material. Formglas maintains an inventory these specific samples, and they can be requested by email to either your local representative, or directly to samples@formglas.com.

The true beauty of MetalCast® is realized when Formglas is called upon, for custom applications, to mold custom textures into the parts it manufactures. Please note that Formglas is not able to formulate MetalCast® material to match any others colors. Please contact your local sales representative to learn more or discuss custom project requirements.



Formglas MetalCast®
Finish: Nickel Silver
Surface: Bush Hammered
Sample Size: 3" x 3"
Sample Code: 98034

Formglas MetalCast®
Finish: Bronze
Surface: Weave
Sample Size: 3" x 3"
Sample Code: 98122

Formglas MetalCast®
Finish: Bronze
Surface: Decorative Trim
Sample Size: 5 ½" x 6 ½"
Sample Code: 98135

Formglas MetalCast®
Finish: Copper
Surface: Decorative Trim
Sample Size: 5 ½" x 6 ½"
Sample Code: 98136

Formglas MetalCast®
Finish: Brass
Surface: Decorative Trim
Sample Size: 5 ½" x 6 ½"
Sample Code: 98137

Formglas MetalCast®
Finish: Nickel Silver
Surface: Decorative Trim
Sample Size: 5 ½" x 6 ½"
Sample Code: 98138

Formglas MetalCast®
Finish: White Metal
Surface: Decorative Trim
Sample Size: 5 ½" x 6 ½"
Sample Code: 98139

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

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