

Trade Name

Formglas® CorniceStone™



Common Names

Stone-textured FRP castings
FRP castings with an aggregate finish



Manufacturer

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COLUMNS & CORNICES

N. CAROLINA RESEARCH CENTER, NC

Summary

CorniceStone™ is a pre-finished, lightweight and high strength fiberglass reinforced plastic (FRP) composite that incorporates natural aggregates and pigments into the creation of molded architectural shapes and elements resembling natural limestone. CorniceStone™ is a Class A fire and smoke rated product that is ideal for a range of exterior applications such as cornices, column cladding, panels, trim details, spandrels and terra cotta replacement, in both new construction and building renovation. CorniceStone™ is an outstanding alternative to GFRC, precast or EIFS because of its high strength, light weight, design flexibility, ease of installation and extreme durability.

Detailed Description

CorniceStone™ is a pre-finished glass fiber reinforced plastic used to make architectural elements. It is a catalyzed thermoset plastic composite that is durable, chemical resistant and has excellent weathering, flexural and tensile physical properties. This makes it a versatile material that provides cost effective solutions for the construction of buildings and renovation of existing structures. It is also a lightweight material, weighing approximately 2 lb/ft² ⇔ 10 kg/m² which reduces transportation, handling and installation costs.

The CorniceStone™ surface consists of a UV stabilized Isophthalic neopentylglycol (NPG) polyester gelcoat and aggregates. The back-up laminate consists of layers of glass fiber and polyester resin. Through a unique and proprietary manufacturing process, it achieves a face finish that resembles a limestone texture. The CorniceStone™ composite material has a Class 1 (or A) fire rating. When CorniceStone™ is molded into shapes, the geometry of the shape imparts physical properties to the parts, such as strength and stiffness. For example, the design profiles of CorniceStone™ parts that include recesses, projections, grooves, curves or ornamentation, make the part stronger. The nominal shell

thickness of parts is 3/16". However, areas of parts that have flat regions are cast thicker by encapsulating core materials into the laminate that provide added strength and stiffness.

CorniceStone™ offers a wide range of advantages for architects and designers including the capability for it to be made into large parts that would otherwise require more costly support structures and increased installation costs (as compared to other materials such as precast or GFRC).

In most cases, CorniceStone™ molded parts are secured to the building structural framing or light gauge steel substrate with concealed fasteners. Joints between parts should be minimized and advantageously positioned in consideration of part size and design, overall appearance, and installation. CorniceStone™ parts are typically supplied with pre-made corners to minimize field mitering.

Some typical architectural applications of CorniceStone™ include facade panels, columns, cornices, pediments, storefront entries, cupolas and other decorative elements such as friezes and signage. CorniceStone™ may also be used for interior applications, where a high impact resistant and lightweight material is desired.

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 complicated design elements or projects, Formglas will work with Architects and Designers to create 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.

Technical Data

Refer to the following standards:

ASTM International (ASTM)

- E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- D790 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics
- D638 - Standard Test Method for Tensile Properties of Plastics
- D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
- D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol impressor
- D648 Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
- D696 - Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics
- D570 - Standard Test Method for Water Absorption of Plastics
- D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

Physical and Mechanical Properties

CorniceStone™ is a fiberglass reinforced polyester resin plastic composite with a nominal thickness of 3/16" ⇔ 4.5 mm. It has 25 to 30% glass fiber content (by weight) in the form of multiple layers of chopped strand mat.

Matrix:	ISO/PNG Polyester Resin
Finish:	Standard and custom colors available.
Surface:	Light, medium and coarse.
Density:	~110 lb/ft³ ⇔ 1760 kg/m³
Weight:	1.75-2.25 lbs/ft² ⇔ 8.5-11 kg/m²*
Shell thickness:	3/16" ⇔ 4.5 mm nominal**
Embedments:	Core mat or other reinforcement as profile, shape or design requires
Glass Fiber:	25-30% typical
Reveals/setbacks:	3° draft minimum
All outside corners:	1/16"-1/8" ⇔ 1.5-3 mm radius
Max. length moldings:	16' ⇔ 4.8 m
Max. size molded parts:	70 ft² ⇔ 6.5 m²

* 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:	≤25 (Class A)
Smoke Development:	≤450 (Class A)
Flexural Strength:	32,000 psi ⇔ 221 Mpa
Tensile Strength:	15,000 psi ⇔ 110 Mpa
Modulus of Elasticity:	1,080,000 PSI (10.5 Gpa)
Impact Resistance:	12 ft-lb/in ⇔ 643 J/m
Barcol Hardness:	44
Heat Deflection:	> 513°F ⇔ 285°C
Coefficient of Linear Thermal Expansion:	2.73 x 10 ⁻⁵ in/in/°F ⇔ 1.5 x 10 ⁻⁶ in/in/°C
Water Absorption:	0.3%
Nail push-through:	1050 lb force ⇔ 4,670 N

Manufacturing Tolerances

Dimensional (all directions):	± 1/8", 0-10 ft ⇔ 3 mm in 3 m
Thickness:	± 1/8" ⇔ 3 mm
Variation from square:	± 1/8", 0-10 ft ⇔ 3 mm in 3 m
Bowing, out of plane	± 1/8"/ft ⇔ 3 mm / 300 mm

LEED®

To ensure that a Class 1 fire rating is maintained, only pure resins are used. Accordingly, CorniceStone™ parts do not contain recycled materials. However, other LEED credits may be available. Please 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

Delivery, Storage and Handling

CorniceStone™ 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. CorniceStone™ parts shall be protected from rain, snow, sunlight, excessive weather conditions, high levels of humidity, and job site damage. Place non-staining resilient spacers between parts and support parts during shipment and subsequent unloading and storage. Protect parts from dirt and damage during handling, transport and storage. Store unpackaged parts indoors on firm, level and smooth surfaces with part identification labels clearly visible.

■ Preparatory Work

Site Conditions:

The site conditions are to be reviewed for compliance with Formglas' requirements relating to installation tolerances and any other conditions that may affect the installation and performance of CorniceStone™ 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 Formglas shop drawings prior to it commencing the manufacture of custom molds and CorniceStone™ 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. It is the installing contractor's responsibility to order the correct quantities of parts including a waste allowance, if applicable.

Substrates:

The framing and/or substrates to accept CorniceStone™ parts shall be surfaced with suitable materials and weather barrier as applicable and installed straight and true within 1/8" in 8 linear ft. ⇔ 3 mm in 2500 mm. The substrate shall be free of obstructions and interference that prevents the correct positioning and attachment of the CorniceStone™ parts. Structural framing and substrate materials shall be of the proper size and design for the intended use and shall be sufficient to properly support the installed CorniceStone™ 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 CorniceStone™ parts as indicated on the approved shop drawings, instructions and the contract documents. The installing contractor is to supply and install all brackets, shims, other hardware and adhesives as required for the installation and proper alignment of the CorniceStone™ parts with adjacent parts and materials. Part thicknesses may vary within the manufacturing tolerances. Allow for shim spaces between the CorniceStone™ and the substrate. Attach the CorniceStone™ parts using corrosion resistant screws, bolts

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.

Cutting:

When cutting parts is required, use the most suitable cutting method listed below. Always wear goggles and a dust mask.

- A reciprocating type saw with a medium grit composite type blade.
- A mini grinder with 4" ⇔ 100 mm medium grit composite blade or diamond blade.
- A chop saw with a diamond blade for smaller moldings etc.
- Formglas to supply 1 ½" batten strips for field cut parts. Refer to Formglas shop drawings for more information.

Attachment:

Wherever possible, CorniceStone™ parts are to be installed with concealed fastening methods such as beneath flashings or behind caulked joints. Parts should have pre-drilled oversize clearance holes for fasteners and neoprene shims (or equivalent) installed behind the panel edges being fastened to facilitate movement due to expansion and contraction. A bond breaker tape should be applied inside the joint over the top of the fasteners prior to caulking the joint.

Joint Treatments:

- All joints must be caulked
- Formglas does not supply caulk for joints but can recommend a type and specific brand for use with CorniceStone™.
- A paintable, one-compound elastomeric low modulus urethane sealant is recommended. (e.g. Sonolastic Ultra or equivalent)
- Use spacers to maintain a uniform gap between parts and install a bond breaker tape inside the joint over top of the fasteners.
- Apply low tack masking tape on either side of the joint and avoid smearing caulk beyond the joint - remove any excess immediately.
- Do NOT attempt a monolithic look - joints can not be hidden.

Patching:

- Patch chips carefully with matching CorniceStone™ putty compound (supplied by Formglas).
- Take precautions to avoid smearing it beyond the repair area.
- Remove excess patching compound immediately with a flexible plastic scraper and damp cloth.
- Follow detailed instruction supplied with the compound.

Always use putty compound sparingly
 Avoid smearing it beyond the holes
 Always remove excess compound immediately

For more details, refer to the installation instructions and project drawings.

■ Cleaning and Maintenance

- Clean soiled CorniceStone™ surfaces with water and household liquid dishwasher detergent.

■ Samples Available

Below are two samples Formglas offers to demonstrate CorniceStone™ in a few colors and textures. We maintain an inventory of these, and samples can be requested by e-mail to either your local Formglas representative, or directly to samples@formglas.com.

Formglas may be able to custom formulate CorniceStone™ to match an array of colors. Please contact your local sales representative to learn more or discuss custom requirements for a specific project.



Formglas CorniceStone™
 Finish: Coffee
 Surface: Medium Texture
 Sample Size: 3" x 3"
 Sample Code: 98117



Formglas CorniceStone™
 Finish: Cream
 Surface: Fine Texture
 Sample Size: 3" x 3"
 Sample Code: 98118

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

■ Applications

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



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N. CAROLINA RESEARCH CENTER, NC



WINDOW MULLIONS AND CLADDING PANELS

HALIFAX REGIONAL HOSPITAL, VIRGINIA