Specification for

ArcusStonecoat™ Cast & Pre-Coated EPS Foam Shapes

Section 06 60 00

This specification encompasses basic requirements for manufactured ArcusStonecoat™ pre-coated EPS foam core architectural shapes manufactured to simulate natural cut stone used in masonry applications. These shapes consist of precut EPS foam cores that are coated with a thickness of ArcusStonecoat limestone finish material through an extrusion, encapsulation or poured mold process.

This specification also includes some requirements for full cast ArcusStone panels, pieces and shapes.

Part 1 General

1.01 Section includes – ArcusStonecoat Precoated EPS Foam and Cast Shapes

Scope - All labor, materials, and equipment to provide the ArcusStonecoat precoated EPS foam or cast shapes shown on architectural drawings and as described in this specification.

A Manufacturer shall furnish ArcusStonecoat precoated EPS foam or cast shapes covered by this specification.

B Installing contractor shall unload, store, furnish all anchors, set and patch the ArcusStonecoat precoated EPS foam or cast shapes as specified.

1.02 Related Sections

Section 01 34 00 Submittal Procedures.

Section 07 24 00 exterior insulation and Finish Systems

Section 07 90 00 Joint Protection / Sealers

1.03 Reference Standards

ASTM C 578 Standard Specifications for Preformed Polystyrene Thermal Insulation.

ASTM C 494 / C 494M Standard Specification for Chemical Admixtures for Cementitious Materials.

ASTM C 1666 / C1666M Standard Specification of Alkali Resistant (AR) Glass Fiber for GFRC and Fiber Reinforced concrete and cement.

ASTM C 932 Standard Specification for Surface-applied Bonding Compounds for Cementitious Materials.

ASTM A 641 Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

EIMA 101.01 Standard Test Method for Freeze-Thaw Resistance of Exterior Insulation and Finishing Systems (EIFS), Class PB (Modified ASTM C67).

EIMA 105.01 Standard Test Method for Alkali-Resistance of Glass Fiber Reinforcing Mesh for use in Exterior Insulation and Finishing Systems (EIFS).

California SCAQMD rule 1113-90 Architectural coatings

1.04 Definitions

ArcusStonecoat Precoated EPS Foam Shape – A refined architectural detail unit manufactured to simulate natural cut stone used in masonry applications. they are manufactured using one of the following three general methods:

1. Extruded units – manufactured using a low slump ArcusStonecoat mix, with either a stationary push box or movable screed sled employed to apply the mix to an EPS core that has had ArcusStone Re-emulsifying Bonding Agent (a chemical bonding agent complying with ASTM C932 and ArcusStone, LLC requirements) applied to the core surfaces to receive the ArcusStonecoat material, OR; has had open weave glass fiber fabric applied, weighing a minimum of 3.5 oz/sq. yd. (118g/m2) and conforming to EIMA Standard105.01, and embedded in a lightweight polymer-modified cementitious adhesive / basecoat to a minimum thickness of 1/8" (3.125 mm), to EIMA Standard 101.01.
2. Poured EPS mold units – manufactured using a high slump ArcusStonecoat mix with a high range water reducer / plasticizer conforming to ASTM C 494 / C 494M, and minimally vibrating the mix into an EPS mold to attain denser consolidation of the mix.
3. Embedded / encapsulated EPS core units – manufactured using a standard slump ArcusStonecoat mix poured into the bottom of EPS, rubber, or other molds, with EPS core shapes positioned in the molds and additional ArcusStonecoat material poured into the voids around the foam cores. The molds are vibrated, then a ¼" minimum thickness of ArcusStonecoat or fiber reinforced, acrylic modified Portland cement plaster is screeded over the exposed EPS core backs, completing the encapsulation of the foam cores.

EPS Foam Core: A rigid, expanded polystyrene (EPS) foam conforming to the physical properties of ASTM C578. Minimum Type I 1.0 lb/cu.ft. (17.0 kg/m3) density. Minimum Type IX 2.0 lb. / cu. ft. (34.0 kg/m3) required for flat panels and shapes exceeding a 15 to 1 ratio of length to average thickness. EXAMPLE: window sill profiles that are to be produced in 24 inch lengths x 4-1/2 inch widths by average thickness of 2 inches, would be required to use Type IX 2.0 lb. / cu. ft. (34.0 kg/m3) density foam cores.

ArcusStonecoat™: ArcusStone LLC decorative limestone finish material that is a lightweight (3 lb/sq. ft. @3/8" thickness), polymer reinforced Portland cement based mix with a minimum thickness of 3/8".

Alkali Resistant (AR), High dispersing (HD) Chopped Glass Fiber: a glass fiber product that is resistant to the alkali conditions that exist in matrices such as those based on Portland cement, and that are use for reinforcement of cement, mortar, and concrete products.

ArcusStone re-emulsifying Bonding Agent: a Vinyl Acetate monomer resin compound bonding agent in compliance with ASTM C 932, used to provide a chemical bond between EPS core and ArcusStonecoat.

Reinforcing Mesh: open weave glass fiber fabric applied, weighing a minimum of 3.5 oz/sq. yd. (118g/m2) and conforming to EIMA 105.01.

Adhesive / Basecoat: an EPS foam compatible polymer modified cementitious material mixed per manufacturer's recommendations, used to attach the ArcusStonecoat Precoated EPS Foam Shapes to an approved substrate and to provide embedding coat for reinforcing mesh, conforming to EIMA 101.01.

mechanical Fasteners: anchors, dowels, screws, and other non-corrosive devices used in conjunction with adhesives to attach the ArcusStonecoat Precoated EPS Foam Shapes to an approved substrate.

Approved Substrate: surface where ArcusStonecoat Precoated EPS Foam Shapes can be attached.

1.05 SUBSTRATE AND DESIGN LIMITATIONS / REQUIREMENTS

A Substrate:

1 The substrate shall be flat to within ¼" (6.4mm) in a 5 foot (1.5m) radius, and shall have a maximum allowable deflection of the substrate system under Code specified load conditions which does not exceed L/360

2 Expansion and control joints are required in the ArcusStonecoat Pre-coated EPS Foam Shapes where they occur in the underlying substrate.

3 Shapes can be applied to the following approved substrates:

a Clean, structurally sound Portland cement plaster (stucco).

b EIFS.

c Poured concrete, free of any surface contaminants that would interfere with a good bond.

d unit masonry, stone veneer, or tile that is sound and adhered properly.

e Properly installed exterior gyp sheathing, cement board, and cement/fiber board.

Note: Consult an ArcusStone technical representative for a review and approval of substrates not listed above

B. Design

1. the manufacturer of ArcusStonecoat coated EPS shapes, panels, extrusions, coated shapes and castings is solely responsible for the proper engineering and design of the pieces.

2. A minimum density of Type IX 2.0 lb. / cu. Ft. (34.0 kg / m3) is REQUIRED for all flat panels and other shapes that meet or exceed a ratio of 15 to 1 length to average thickness. EXAMPLE: window sill profiles that are to be produced in 24 inch lengths x 4-1/2 inch widths by average thickness of 2 inches, would be required to use Type IX 2.0 lb. / cu. ft. (34.0 kg/m3) density foam cores.

3. Complete encapsulation of the EPS core with ArcusStonecoat, or fiber reinforced acrylic modified Portland cement plaster, is REQUIRED for flat panels and other shapes that meet or exceed a 15 to 1 ratio length to average thickness. The facing and sides or edges of all encapsulated pieces are to be covered with a minimum 3/8" thickness of ArcusStonecoat. The back of such pieces or panels shall have a ¼" minimum thickness of ArcusStonecoat, or fiber reinforced acrylic modified Portland cement plaster, covering the surface.

4. It is REQUIRED that any pieces, panels and shapes having an average thickness of 1 inch or less shall be full cast, i.e. EPS foam cores or other material shall not be used as part of the manufactured piece, panel, or shape.

5. Oversized cast, coated, extruded, poured, and otherwise manufactured panels, pieces and shapes are required to be manufactured using integral, alkali resistive, high dispersing, chopped glass fibers of ¼ (6 mm) in length.

6. All cast, coated, extruded, poured, and otherwise manufactured panels, pieces and shapes are required to be cured a minimum of 14 days, using techniques such as covering the pieces with poly sheeting to promote adequate and proper curing.

7. All cast, coated, extruded, poured, and otherwise manufactured panels, pieces and shapes are required to be sealed at the manufacturing facility prior to shipping using ArcusStone's Penetrating Water Repellant or other approved penetrating, water proofing sealer. Do not apply any sealer before the pieces have achieved a minimum of 48 hours cure after de-molding, casting, or coating with ArcusStonecoat.

1.06 Quality Assurance

A. Manufacturer Qualifications:

1. Manufacturer shall have sufficient plant facilities to produce the shapes, quantities, and sizes of ArcusStonecoat Pre-coated EPS Foam Shapes required in accordance with project schedule.

2. Manufacturer shall submit a list of projects similar in scope and at least two (2) years of age, along with owner, Architect, and contractor references.

3. Manufacturer shall be an ArcusStone Authorized Manufacturer, as approved by ArcusStone, LLC.

B. Standards: manufacturer shall comply with the requirements of ArcusStone,LLC technical and Application Manuals, the project specifications, contract documents, and all applicable local codes.

C. Mock-up: Provide full size unit(s) for use in construction of sample wall. The approved mock-up shall become the standard for appearance and workmanship for the project. Maintain accepted mock-up(s) until substantial completion of the work. Mock-up may become part of the completed work.

1.07 Submittals

A. Comply with Section 01 34 00 – Submittal procedures.

B. Submit shop drawings including dimensioned profiles, cross sections, tolerances, ornamentation, reinforcement, exposed faces, arrangement of joints, attachment methods, and anchors (where required).

C. Samples: Prior to start of project, provide 1' (.25m) long pieces of each shape, demonstrating the general range of variations in detail and color that are expected. Samples are to be clearly labeled with manufacturer's logo and other identification markings.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Package shapes to protect them from staining or sustaining other damage during shipping and storage.

B. Mark shapes with identification marks as shown on shop drawings, and with manufacturer's labels intact and legible.

C. Store shapes on site in a cool, dry location, out of direct sunlight and weather. Store in such a manner as to prevent cracking, distortion, staining, warping, or other physical damage.

D. Provide an itemized list of product to support the Bill of Lading.

1.09 Project Conditions

A. Weather and Environment: Comply with adhesive manufacturer's guidelines and installation instructions.

B. Wall surface and ambient air temperature shall be at least 40F(4C), and rising, during the installation of the ArcusStonecoat Pre-coated EPS Foam Shapes.

Wall surfaces and ambient air temperatures must remain above 40F (4C) for a minimum of 48 hours after installation. Do not adhesively attach pieces if ambient and / or substrate temperatures are over 100 degrees F. Do not install pieces on wet or frozen substrates.

C. Protection: Supplemental heat shall be provided for installation where temperature is less than 40F (4C).

Measures should be taken to prevent condensation and / or heat build-up when tarps and plastic sheeting are used to protect the work and provide additional heat. maintain protection and supplemental heat for a minimum of 48 hours after installation.

D. Protect open joints from water intrusion during construction, using tarps or other means.

1.10 SEQUENCING AND SCHEDULING

A. ArcusStonecoat Pre-coated EPS Foam Shapes installation should be coordinated with other work to minimize delays and facilitate proper installation of the shapes.

B. Cover shapes immediately to prevent water infiltration behind units.

C. Install joint sealant as soon as possible after shapes are installed.

D. Install sealer as soon as possible after joint sealant, following sealer manufacturer's recommended procedure for installation and protection during cure.

Part 2 Products

2.01 Acceptable manufacturers

Contact ArcusStone, LLC, 8725 Youngerman Ct. Suite 203, Jacksonville, FL 32244 (415) 339-4060, info@arcusstone. com, for a current list of ArcusStonecoat Pre-coated EPS Foam Shapes authorized manufacturers, or to verify that a manufacturer is recognized as an authorized manufacturer.

2.02 Materials

A. Foam Core: Expanded Polystyrene (EPS) conforming to physical properties of ASTM C578 Type I, Type VIII, Type II, or Type IV, depending on specifications and contract documents.

B. ArcusStonecoat™: ArcusStone, LLC crushed limestone finish material that is a lightweight (3 lb/sq. ft. @ 3/8" thickness), polymer reinforced Portland cement based, with a minimum applied thickness of 3/8".

c. ArcusStone re-emulsifying Bonding Agent: a Vinyl Acetate monomer resin compound bonding agent in compliance with ASTM C 932 used to provide a chemical bond between EPS core and ArcusStonecoat.

D. Reinforcing Mesh: glass fiber open weave fiber fabric treated for compatibility with cementitious materials conforming to EIMA 105.01, 3.5 oz / sq. yd. (118g/m2).

E. Adhesive / Basecoat: polymer modified cementitious material used as a basecoat for EIFS, and as an adhesive for attaching shapes to acceptable substrates, conforming to EIMA 101.01.

F. High Range Water Reducer / Plasticizer: liquid admix conforming to ASTM C 494 / C 494M, used in the ArcusStonecoat mix when manufacturing ArcusStonecoat Pre-coated EPS Foam Shapes using EPS molds.

G. 1/4" AR (Alkali resistive) HD (high dispersion) chopped glass fibers confirming to ASTM C1666 / C1666M.

2.03 Miscellaneous Materials

A. Embedded or inserted Attaching hardware: members integrated into the shapes for purposes of attachment that are not visible on the finished surfaces, complying with ASTM A 641.

B. Form / mold release Agents: liquid release agents suitable for expanded polystyrene molds that meet or exceed California SCAQMD rule 1113-90.

C. Defoamers: hydrophobic, non-silicone based powdered agents that may be added to the ArcusStonecoat material to densify it and promote a smooth finish without bug holes and pin holes.

2.04 Fabrication

A. Fabricate ArcusStonecoat Pre-coated EPS Foam Shapes with a minimum thickness of 3/8" (9.75mm) of ArcusStonecoat material on all finished, exposed surfaces. **Important!** Some designs may require a thicker minimum coating and / or complete encapsulation of the foam cores.

B. Encapsulate back side with minimum ¼" thickness of either ArcusStonecoat or Portland cement plaster where required. Refer to Section 1.05 (B.) for specifics on when encapsulation is required.

C. Fabricate using 4 ounces by volume (approx. 60 grams by weight) of ¼" AR (alkali resistive) HD (high dispersing) chopped glass fibers per 50 lb. ArcusStonecoat mix, sprinkling the fibers into the mix while blending. DO NOT PLACE FIBERS DIRECTLY IN MIX WATER PRIOR TO BLENDING THE MATERIAL. After all fibers and ArcusStonecoat materials are wetted, continue to mix for 2 minutes, then follow normal mixing protocol, letting the material take a false set then remixing for another 9 0 seconds.

D. Use a minimum of 2.0 lbs / cu. Ft. density EPS foam where required. Refer to Section 1.05 (B.) for specifics on when 2.0 lb. foam is required.

E. Provide finished surfaces per specifications and contract documents, repairing voids, scratches, and hollows as needed.

F. Fabricate ArcusStonecoat Pre-coated EPS Foam Shapes to the dimensional tolerances as follows:

1. Thickness: +/- 1/8" (3.2mm).
2. Squareness: not to exceed ¼' (6.4mm) difference between diagonals in 16 sq. ft. (1.48 m2).
3. Edge Straightness: +/- 1/16" (1.6mm).
4. Joint Edge: +/- 1/8" (3.2mm).
5. Planes Surface Straightness: +/- 1/8" (3.2mm).
6. Overall Assembled Length and Width: +/- 1/8" (3.2mm) per 10' (3m).
7. Chords, Radiuses, and Diameters: +/- 1/8" (3.2mm).
8. 1/4" per foot minimum slope on horizontal surfaces, such as sills, parapets, cornices, wall caps and similar pieces.

2.05 Properly cure the Shapes

A. Initial cure - if using molds to manufacture shapes, place the molds in a temperature and humidity controlled environment for the initial 24 hours prior to de-molding. Temperature should be 65 to 85 degrees F. Relative humidity to be at least 20%. Cover the molds with plastic tarps or curing blankets during this period.

B. After de-molding or extruding – Place pieces on a FLAT, NON ABSORBANT surface, and complete any finishing as needed. Store the pieces under tented plastic (not touching the finished surfaces) for 48 hours. Continue to cure pieces while protecting from extreme heat or cold, sunlight, or water splash, for a minimum of 14 days prior to shipping or installation.

Part 3 Execution

3.01 Substrate

A. Substrate shall be of an approved type, and shall be dry, free of dust, dirt, and any other contaminants that would interfere with a good bond.

B. Substrate shall be free of planar irregularities greater than ¼" (6.4 mm), in a 5' (1.5m) radius.

Report unsatisfactory conditions to the Contractor for correction by substrate installer prior to installation of the shapes.

3.02 Installation

A. ArcusStonecoat Pre-coated EPS Foam Shapes shall be installed plumb, level, true, and in alignment with adjacent shapes.

B. Install the ArcusStone Pre-coated EPS Foam Shapes to the following tolerances:

1. Joint Width: not to exceed 3/8" (9.5mm).
2. Joint Alignment: not to exceed 1/8" (3.2mm).
3. Deviation from Plane: +/- ¼" (6.4mm) per 25' (7.62m).
4. Deviation from Plumb: +/- 1/8" (3.2mm) per 10' (3m).
5. deviation from Plane and Alignment, Panel to Panel: 1/16"

C. Attach shapes using approved adhesive by applying the adhesive with a 3/8" notched trowel, creating vertical ridges on the predampened, clean, backside of the shape. Immediately place the shape after application of the adhesive.

D. After adhering a piece to the substrate, apply more adhesive with a stainless steel trowel to a 3/16" thick coating on the butt-ends, and to within approx. ½" from the finished face, then adhere the next piece adjacent, and the next until complete, then brace the pieces for the time designated by the adhesive manufacturer until the adhesive has achieved sufficient cure.

E. Do not use pneumatic guns to attach fasteners. Do not run fasteners through finished surfaces of shape.

F. Install approved joint sealant. Tool the sealant as needed to achieve the specified profile.

G. Install approved sealer if specified.

End of Section