

# PERMA•CRETE® Surface Finish System - ICF

An Exterior Surface Finish System for Insulated Concrete Form Construction (ICF)

## Manufacturer's Specifications

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### PART I - GENERAL

#### 1.01 SUMMARY

This document contains the Manufacturer's requirements for the proper design, use, and installation of the PermaCrete Surface Finish System - ICF (Insulated Concrete Form). The PermaCrete surface coating consists of PermaCrete Matrix Mix, a high early-strength concrete compound with specially- blended additives; PermaCrete Bonding Additive, a high-solids, acrylic polymer resin; Matrix Colorant (if desired), a liquid dispersion colorant; PermaMesh Fiber Cloth, a fiberglass, open weave mesh; PermaSeal Sealer, a water-based, acrylic-emulsion sealer.

#### 1.02 REFERENCES / PERFORMANCE

##### A. Per AC 219, "Acceptance Criteria for Exterior Insulation and Finish Systems"

1. ASTM C297 . . . . .Tensile Bond
2. AC 219 . . . . .Freeze-Thaw Cycle Resistance
3. ASTM B117 . . . . .Salt Spray Resistance
4. ASTM D2247 . . . . .Water Resistance
5. ASTM E330 . . . . .Structural Performance
6. ASTM G155-04 . . . . .Accelerated Weathering
7. AC 38 . . . . .Ultra Violet Aging
8. AC 38 . . . . .Accelerated Aging Cycle
9. AATCC 127 per AC 38. . . . .Water Resistance
10. ASTM E84 -03 . . . . .Surface Burning Characteristics of Burning Materials
11. NFPA 268 . . . . .Wall Assembly Ignitibility

##### B. Per AC 39, "Acceptance Criteria for Walking Decks"

1. ASTM D570 . . . . .Water Absorption
2. ASTM D2299 . . . . .Chemical Resistance
3. AC 39 . . . . .Concentrated Load
4. ASTM C348 . . . . .Flexural Strength
5. ASTM C190 . . . . .Tensile Strength
6. ASTM C882 . . . . .Shear Bond Adhesion
7. ASTM C994 . . . . .Abrasion Resistance
8. ASTM G-21 . . . . .Mildew Resistance
9. ASTM C596 . . . . .Shrinkage

#### 1.03 DEFINITIONS

- A. **Dealer:** An independent PermaCrete installer.
- B. **PermaCrete:** Registered trademark for PermaCrete products.
- C. **Quality Systems, Inc.:** Manufacturer of PermaCrete products.
- D. **Substrate:** The ICF or additional layer of EPS (expanded polystyrene) foam surface to which PermaCrete materials are applied for the surface finish.

#### 1.04 DESCRIPTION

- A. PermaCrete Surface Finish System- ICF (Insulated Concrete Form). A cementitious coating consisting of matrix mix, bonding additive, fiber mesh, and acrylic sealer.
- B. Design Requirements:
  1. Acceptable surfaces for the PermaCrete Surface Finish System - ICF (Insulated Concrete Form) include ICF surfaces

consisting of molded EPS

manufactured with buried webs and/or ICF profiles with exposed webs when additional EPS is applied to the ICF surface covering the exposed webs. Contact Quality Systems, Inc. for recommendations regarding other products.

2. Vapor Retarders: Use, type and location of vapor retarders, within a wall assembly, is the responsibility of the Architect and shall be noted on the project drawings and specifications.
  3. The substrate shall be clean, flat, and smooth. There shall be no UV degradation of the EPS surface to inhibit adhesion of the coating materials.
  4. Projecting surfaces and aesthetic details shall have a minimum slope of 6:12, and a maximum length (from the wall plane) of 305 mm (12 in).
  5. The specified ICF profiles shall comply with all applicable code requirements for the construction type (combustible or non-combustible). Details shall demonstrate proper termination requirements for combustible or non-combustible construction (refer to published details from ICF manufacturer).
- C. Performance Requirements: At minimum, PermaCrete materials shall be tested as follows:
1. Water-Absorption Resistance: ASTM D570
  2. Chemical Resistance: ASTM D2299
  3. Concentrated Load: AC 39
  4. Tensile-Bond: ASTM C297
  5. Freeze-Thaw Resistance: AC 219
  6. Salt Spray Resistance: ASTM B117
  7. Water Resistance: ASTM D2247 and AATCC 127 per AC 38
  8. Structural Performance: ASTM E330
  9. Accelerated Weathering: ASTM G155
  10. Ultraviolet Aging: AC 38
  11. Accelerated Aging Cycling: AC 38
  12. Flame Spread: ASTM E84

### 1.05 SUBMITTALS

- A. Literature: Submit name of Surface Finish System company that is being used, and the literature on the exact products that are to be used. Submit with the literature of the product's information including current MSDS sheets.
- B. Samples: Prepare two 3' x 3' areas or suitable samples for review by the Architect. Do not proceed with Finish System until Architect approves the sample area. Leave one sample on jobsite, and one sample protected with the Architect.

### 1.06 QUALITY ASSURANCE

- A. Manufacturer: All materials will be manufactured, sold and distributed by Quality Systems, Inc.(QSI), 1101 Menzler Road, Nashville, TN 37210; Telephone 800-607-3762; Fax 615-834-1335; Website [www.permacrete.com](http://www.permacrete.com)
- B. Dealer: Only craftsmen who have a demonstrable skill in the work covered under this specification shall be contracted. A firm with a minimum of one (1) year's experience in the application of materials similar to those specified herein shall be used.

### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. All materials shall be delivered in original, unopened containers to the jobsite. Upon arrival, all materials should be inspected for any possible shipping damages.
- B. All materials used on the project shall be stored in a place designated by the Owner or the Architect. Such storage place shall be kept neat, clean, dry and between 40°-90°F, and all damage thereto or to its surroundings shall be made good by the Contractor.
- C. All used waste or trash must be removed from the building or site location each night, and every precaution taken to avoid the danger of fire.
- D. The Dealer shall protect surfaces and objects outside the building, as well as the grounds, lawns, shrubbery, and adjacent properties against damage. The Dealer shall hold himself responsible for damage to adjacent surroundings.
- E. At completion of work, the Dealer shall remove from the premises all debris created by him; he shall remove all material splatters and leave his part of the work in a clean and finished condition.

### 1.08 PROJECT CONDITIONS

- A. If applying below 50°F, check Manufacturer's recommended procedure.
- B. Dealer will need access to electric power and clean water at the installation area.

### 1.09 WARRANTY

- A. Product Warranty: Quality Systems, Inc. (QSI) warrants to Dealer that the Products therefore shall be free from defects in material and workmanship for a period of one year from the date of shipment to Dealer, and QSI's liability shall be limited solely to the replacement of defective materials, as the case may be, which are proven to be defective upon QSI's inspection. For further warranty details, please contact QSI.
- B. Installation Warranty: Issued by the independent, installing Dealer to his retail customer and normally for a period of one (1) year. Additionally, a Dealer may, at his option, issue an extended warranty and / or an annual maintenance agreement. PermaCrete products must be installed in accordance with the Manufacturer's current, published specifications, product instructions, and installation procedures. Each installation is solely the responsibility of the Independent PermaCrete Dealer. Quality Systems, Inc., does not recommend and does not provide a warranty for use of PermaCrete products as any part of an Exterior Insulation Finish System (EIFS) applied over any framed structure, excluding architectural details which may be framed, sheathed and covered with expanded polystyrene board or cement board. Please contact Quality Systems, Inc. for additional information.

### 1.10 MAINTENANCE

- A. Clean with a liquid or powdered laundry detergent (without bleach) in a normal solution of one cup to five gallons of water.
- B. For resealing or other maintenance, please contact the Dealer.

## PART II - PRODUCT

### 2.01 MANUFACTURER

All materials and components of the PermaCrete Surface Finish System - ICF, shall be purchased directly from Quality Systems, Inc. by the Dealer.

### 2.02 MATERIALS

- A. Matrix Mix - Portland cement and proprietary additives
- B. Bonding Additive - Acrylic polymer resin
- C. Matrix Colorant - Liquid dispersion colorant
- D. Fiber Mesh Cloth - Fiberglass weave mesh.
- E. Sealer - Acrylic polymer emulsion sealer

### 2.03 COMPONENTS

Base Coat and Finishing Coats are created from the same components.

- A. PermaCrete Matrix Mix
  - 1. Concrete compound with a blend of special cements and additives.
  - 2. Bonds securely to properly prepared EPS surfaces.
  - 3. Used to create protective surface finish for ICF construction.
  - 4. Non-shrinking.
  - 5. Used in thicknesses of 1/8" to 3/4".
  - 6. Mixed on site with PermaCrete Bonding Additive (wet).
  - 7. Available in 2 main finish types, PermaCrete (fine) and PermaGrit (textured).
  - 8. Pre-tinted Matrix Mix also available. Contact Quality Systems for details.
  - 8. Design strength exceeds ASTM C-387 for High Early Strength Concrete.
- B. PermaCrete Bonding Additive
  - 1. High-solids, water-soluble, acrylic polymer compound used specifically for modifying a Portland cement composition such as Matrix Mix.
  - 2. Used to provide a superior bond to EPS surfaces.
  - 3. Mixed with Matrix Mix on site.
- C. PermaMesh Fiber Cloth
  - 1. A balanced, open-weave mesh made from twisted multi-end strands.
  - 2. Colored red to visibly ensure coverage.
- D. PermaSeal Sealer
  - 1. A penetrating, acrylic emulsion formulated with special acrylic polymers and quick evaporating solvents that dry to a hard, very durable polymer film.
  - 2. PermaSeal is available in clear or one of 170 standard colors (Custom colors also available from QSI).
  - 3. Resistant to chemicals, acids, salts and detergents.

4. Provides a strong protective finish that resists cracking, chipping, peeling and mildew.
5. Resistant to freeze-thaw cycles.
6. Non-flammable and non-toxic.

## PART III EXECUTION

### 3.01 EXAMINATION

- A. Before installation of the PermaCrete Surface Finish System - ICF , the Dealer will ensure that the substrate is in accordance with the guidelines listed in Section 1.04.B
- B. Before installation, the Dealer shall ensure all penetrations through and terminations of the substrate shall be protected with flashing or sealants in accordance with the requirements of the applicable code and the ICF manufacturer’s published installation instructions.

### 3.02 SURFACE PREPARATION

- A. Substrate shall be clean, sound, and in accordance with applicable codes.
- B. The EPS surface shall be clean, flat, and smooth. There shall be no UV degradation of the EPS surface to inhibit adhesion of the coating materials.
- C. The specified ICF profiles shall comply with all applicable code requirements for the construction type (combustible or non-combustible). Details shall demonstrate proper termination requirements for combustible or non-combustible construction (refer to published details from ICF manufacturer).

### 3.03 INSTALLATION

- A. Mix one 40-lb bag of Matrix Mix with one gallon of Bonding Additive (acrylic polymer resin) using an electric drill and proper mixing paddle to produce a smooth, lump free mixture. Add Matrix Mix Colorant, if desired. [When using **PermaCrete** Matrix Mix, **it may be used within 20-45 minutes**, depending upon air temperature; remix (if desired) during application to loosen mixture. When using **PolarSet** Matrix Mix, **it must be used immediately**; remix (if desired) during application to loosen mixture. When using **TropicSet** Matrix Mix, **it must be allowed to sit for approximately five (5) minutes, then re-mixed** to a uniform consistency before using.]
- B. Spray or trowel entire surface area with a light coat of Matrix mixture before applying the PermaMesh Fiber Cloth into the wet surface area.
- C. Lightly trowel mesh down into Matrix mixture.
- D. Continue with further applications of Matrix application(s) to completely fill and cover PermaMesh on surface area until red mesh color can no longer be seen.
- E. By using spray hopper assembly, or continuous PowerFlo unit, or hand troweling, apply initial application of Matrix mixture to entire surface and patch uneven areas to achieve smooth, level surface.
- F. Note: Before application of final texture coat, expansion (control) joints may be added. Expansion joints should be installed where stress cracking is indicated in horizontal or vertical surfaces; at each floor level; at changes or breakpoints in the wall substrate such as window or door openings; and at the surface structure’s existing control or expansion joints. Note: After the final texture coat application, all joints must be caulked with Perma-Caulk Sealant, or equivalent, and, if required by architectural specs, capped with an expansion joint insert.
- G. Apply additional applications of Matrix mixture as needed to achieve proper coverage (minimum 3/16” completed thickness) and hand-trowel surface to desired texture, or allow sprayed application to remain as the (stucco-type) surface finish.
- H. To achieve a “worm-like” or scraped surface finish, use heavy grit Matrix (containing coarse sand), such as Perma-Grit, Polar-Grit or Tropic-Grit Matrix Mixes, and hand-trowel surface.
- I. Apply Perma-Caulk Sealant, or equivalent, and approved weather stripping around all doors and windows, if needed. Note: This is not a substitute for specific flashing recommended by the Architect, or door and window manufacturers.
- J. After all Matrix applications have fully hardened, use airless paint sprayer or roller, along with cut-in brush, to apply 2-3 applications of Perma-Seal Sealer (water base) as needed to protect surface and create the desired surface color.
- K. Never use solvent base sealers on the Matrix applications of any foam EPS surface as the solvents may deteriorate the foam through any pinholes left in the Matrix application.
- L. Ensure minimum 4 hours dry time at 72°F before surface contact with rain, dew, or freezing temperatures.

### 3.04 FIELD QUALITY CONTROL

- A. Each installation is solely the responsibility of the Dealer.
- B. Quality Systems, Inc. assumes no responsibility for on-site inspections or application of its products.

### 3.05 CLEANING

- A. Surrounding areas that are not to be surfaced with Matrix Mix should be taped off and covered with plastic or paper.
- B. The Dealer shall protect surfaces and objects outside the building, as well as the grounds, lawns, shrubbery, and adjacent properties against damage. The Dealer shall hold himself responsible for damage to adjacent surroundings.
- C. At completion of work, the Dealer shall remove from the premises all surplus materials and all debris created by him; he shall remove all Material splatters and leave his part of the work in a clean and finished condition.

### 3.06 PROTECTION

- A. The PermaCrete Surface Finish System - ICF , shall be protected from damage and exposure to contaminants until fully cured.

### DISCLAIMER

PERMA•CRETE® products must be installed in accordance with the manufacturer's current, published specifications, product instructions, and installation procedures. Each installation is solely the responsibility of the Independent PermaCrete Dealer. Quality Systems, Inc., does not recommend and does not provide a warranty for use of PermaCrete products as any part of an Exterior Insulation Finish System (EIFS) applied over any framed structure, excluding architectural details which may be framed, sheathed, and covered with expanded polystyrene board or cement board. Please contact Quality Systems, Inc., for additional information.

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