

SECTION 09 97 23

MINERAL STAIN COLOR TREATMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Application of silicate mineral stain. Specification includes limited surface preparation.
- B. Related Sections: Related sections include the following:
PLACE RELATED SECTIONS BELOW. EXAMPLES INCLUDE:
 - 1. Section 03 30 00 - Cast-in-Place Concrete
 - 2. Section 03 11 16.13 - Concrete Form Liners
 - 3. Section 03 45 13 - Faced Architectural Precast Concrete
 - 4. Section 03 47 13 - Tilt-Up Concrete
 - 5. Section 04 21 13 - Brick Masonry
 - 6. Section 04 22 00 - Concrete Unit Masonry
 - 7. Section 09 25 23 - Stucco Repairs

1.2 REFERENCES

- A. General: The publications listed below form a part of this Specification to the extent referenced.
The publications are referred to in the text by the basic designation only.
- B. ASTM (ASTM):
 - 1. ASTM E 96, "Standard Test Methods for Water Vapor Transmission of Materials."
 - 2. ASTM E 514, "Standard Test Method for Water Penetration and Leakage Through Masonry."
 - 3. ASTM G 154, "Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials."
 - 4. ASTM D 6886-12, "Standard Test Method for Determination of the Individual Volatile Organic Compounds (VOCs) in Air-Dry Coatings by Gas Chromatography."
- C. Deutsches Institute for Normung (DIN), European Standard (EN), and International Organization for Standardization (ISO):
 - 1. DIN EN 1062, manufacturing standard for sol-silicate coating.
 - 2. ISO 6504-3, "Paints and varnishes - Determination of hiding power - Part 3: Determination of contrast ratio of light-colored paints at a fixed spreading rate."
 - 3. EN 1062-3, "Paints and varnishes - Coating materials and coating systems for exterior masonry and concrete - Part 3: Determination of liquid water permeability."
 - 4. DIN EN 1504-2, "Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 2: Surface protection systems for concrete."
 - 5. DIN EN ISO 7783-2, "Coating materials and coating systems for exterior masonry and concrete - Part 2: Determination and classification of water-vapor transmission rate (permeability)."

6. DIN 4102-A2, "Fire Behavior of Building Materials and Building Components - Part 2: Building Components; Definitions, Requirements and Tests."

1.3 DEFINITIONS

- A. Mineral stain, base coat: The first application of the mineral stain.
- B. Mineral stain, top coat: The second application of the mineral stain-if needed.
- C. Dilution: A mineral based diluent.
- D. Application Ratio: A mixture of mineral stain and mineral dilution expressed as a ratio of one to the other to achieve the proper color transparency for the mineral stain.
- E. Approved Application: The application ratio and application steps derived from the approved mock up from Section 1.6, B.6.e. Approved Application.

1.4 SYSTEM DESCRIPTION

- A. A materials-compatible highly vapor permeable water and weather-resistant decorative stain system.
 1. Mineral stain:
 - a. Mineral stain penetrates the surface and in a chemical reaction combines with the substrate through chemical and mechanical bonds forming a hard amorphous microporous layer with extremely high vapor permeability.
 - b. Unaffected by acids, UV exposure, or air-borne pollutants.
 - c. Unique alkaline mineral layer structure resists liquid water penetration into the coated substrate and maintains moisture balance through vapor diffusion to keep wall assemblies breathable and dry, thus resisting mold and biological growth.
 - d. Will not reduce substrate vapor permeability.

1.5 SUBMITTALS

- A. Product Data: Submit product data showing material proposed. Submit sufficient information to determine compliance with the Drawings and Specifications. Provide published documentation describing materials, characteristics, and limitations.
- B. Samples: Submit samples for verification purposes, fabrication techniques and workmanship.
- C. Manufacturer's Instructions: Submit manufacturer's instructions including technical data sheets, material safety data sheets, mixing instructions, application requirements, special procedures, and conditions requiring special attention.
- D. LEED Submittals: Submittals that are required to comply with requirements for LEED certification include the following:
 1. Low Emitting Materials: Submit certification by the manufacturer confirming that products (i.e., adhesives, sealants, paints, coatings, etc.) meet or exceed the volatile organic compound (VOC) limits set by specific agencies or other requirements. Clearly state VOC limits in the submittal.

1.6 QUALITY ASSURANCE

- A. Qualifications:
 1. Manufacturer Qualifications: Provide evidence that Manufacturer is a firm engaged in the manufacture of mineral stains of types required, and whose products have been in satisfactory use in similar service for a minimum of twenty years.

2. Applicator Qualifications: Provide evidence applicator has a minimum of three years of successful application experience using mineral stains with projects similar in type and scope to that required for this Project.

B. Mock-Ups:

1. Prior to application of the work, fabricate and erect mock-ups for each type of finish and application to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution.
2. Build mock-ups to comply with the following requirements using materials indicated for final unit of work.
3. Locate mock-ups as directed by the Architect.
4. Demonstrate the proposed range of aesthetic effects and workmanship to be expected in the completed work.
5. Obtain the Architect's acceptance of mock-ups before start of final unit of work.
6. Determine Application Ratio:
 - a. Locate area(s) to receive the mineral stain mock-up samples. Prepare surfaces as directed in Sections 3.1 EXAMINATION, 3.2 PREPARATION, and 3.3 APPLICATION.
 - b. Determine with architect a range of transparency to achieve desired optical equalization.
 - c. Prepare sample material: Provide minimum three transparent examples of mineral stain and dilution mixed in a ratio of one to the other. Maintain a record of prepared stain color and dilution ratio mixtures.
 - d. Stir well for one minute and keep well-stirred thereafter for color consistency. Apply sample material as directed in Section 2.4 FINISHES. Apply the prepared samples. If necessary, adjust ratios to obtain the desired results. Results may be evaluated for approval after final application has cured minimum 24 hours.
 - e. Approved Application: Maintain a record of the approved mock up stain color, application ratio, and application steps to incorporate into final unit of work to ensure color consistency and appearance aesthetics.

C. Tracking Job Progress with Daily Logs

1. Maintain a daily record of the weather conditions, of material ordered and delivered, material used, inspections, areas of work that began, areas of work that were completed, and questions raised and answers received.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with manufacturer's name, material and product brand name, and lot number, if any.
- B. Store materials in their original undamaged packages and containers inside a well ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.8 PROJECT CONDITIONS

- A. Environmental Requirements:
 1. Do not apply in freezing conditions, when rain is expected, or in high winds.

1.9 WARRANTY

A. Provide installer's written warranty.

1. Warranty period from date of Substantial Completion is 25 years.
2. Known installer/warranty provider:
 - a. OnVision LLC, 400 Trade Center Drive, St. Peters, MO 63376; 573-691-4066, sherlache@onvisionllc.com.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design:

1. Items specified are to establish a standard of quality for design, function, materials, compatibility, performance, warranty, and appearance.
2. Equivalent products by listed manufacturers are acceptable.
3. The Architect is the sole judge of the basis of what is equivalent.

B. Listed Manufacturers – **see warranty requirement**

1. KEIM Mineral Coatings of America, Inc., 10615 Texland Blvd. #600, Charlotte, North Carolina 28273. Telephone 704-588-4811. Email keim-info@keim.com.

2.2 MATERIALS

A. Mineral stain: Provide sol-silicate based mineral stain meeting or conforming to:

1. DIN EN 1062, manufacturing standard for sol-silicate coating.
2. DIN EN 1504-2/2.2, Products and systems for the protection and repair of concrete structures/Surface protection systems for concrete (when applied together with KEIM Silan 100)
3. DIN 4102-A2, non-flammable standard – will not burn.
4. ASTM E 96 Vapor Permeability – 75 to 85 perms.
5. ASTM G 154 Accelerated Weathering – no fading, cracking, peeling.
6. ASTM E 514 62-MPH Wind-Driven Rain Test – no water penetration.
7. ASTM D 6886-12 Standard Test Method for Individual Volatile Organic Compounds (VOCs) – Zero (0) grams per liter VOC (Volatile Organic Content).
8. Tinted to the desired finish color.
9. Basis of Design: "KEIM Design-Lasur", KEIM Mineral Coatings of America, Inc.

B. Dilution for mineral stain: Provide silicate dilution meeting or conforming to:

1. DIN 4102-A2, non-flammable standard – will not burn.
2. ASTM E 96 Vapor Permeability – 75 to 85 perms.
3. ASTM D 6886-12 Standard Test Method for Individual Volatile Organic Compounds (VOCs) – Zero (0) grams per liter VOC (Volatile Organic Content).
4. Basis of Design: "KEIM Design-Dilution", KEIM Mineral Coatings of America, Inc.

2.3 EQUIPMENT

A. Tools:

1. Mineral stain: Apply by natural bristle façade brush, professional roller, or professional airless spray equipment and back-roll as required for even distribution.

2.4 FINISHES

A. Mineral stain:

1. Apply in full coverage evenly distributed coats to a smooth mineral matte finish without lap lines, voids, "holidays", or drips. Compare manufacturer-verified mock up consumption data with application consumption data to ensure enough product is applied.
2. Maintain a wet edge to prevent sight lines and textural differences.
3. Apply enough product to prevent shading and textural differences that contribute to striping. Applying inadequate amount of product can produce unexpected results.
4. When rolling product, quickly coat the surface and then gently even it up with the roller. Roll off in same direction across façade to prevent shading differences that affect appearance of color.
5. When spraying product:
 - a. Do not strain mineral stain.
 - b. Remove paint filters from spray gun and spray pump.
 - c. Use only new hoses. Used hoses may contain paint thinners or solvents.
 - d. Paint thinners and cleaning solvents are not compatible with mineral stain.
 - e. Clear gun and spray equipment with warm soapy water and rinse well with clean water to remove residual paint thinners and solvents.
 - f. Never use tips with smaller orifices than recommended. Smaller tips clog and prevent proper stain application. Improper application voids warranty and shortens longevity of the stain.
 - g. Prevent overspray drift or misting onto glass objects.
6. When working from scaffolding, work as a team moving across façade maximum eight (8) vertical feet per applicator to ensure complete coverage and wet edge left to right and top to bottom of each section.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Confirm by examination the areas and conditions under which the work is to be applied for compliance with manufacturer's instructions. Do not proceed with the work until unsatisfactory conditions have been corrected.
 1. Verify substrate is secure, sound, dry, and absorbent, and free of dirt, grease, salts, oil-based paints, release agents, curing agents, and other bond breakers.
 2. Verify substrate has no pretreatments or priming materials applied unless such conditions are approved by manufacturer.
 3. Verify surfaces or materials to be coated are fully cured to manufacturer recommendations.
 4. Confirm coating surfaces are less than 40 percent relative humidity as measured by a masonry moisture meter prior to application of silicate stain.

5. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Applicator.

3.2 PREPARATION

A. Protection:

1. Lay ground cloths and take measures as necessary to protect surfaces subject to contact by products specified by this Section.
2. Mineral stain or dilution may etch or bond to glass, metal, and concrete.

3.3 APPLICATION

A. Conform to reviewed product data, manufacturer's written instructions, and provisions of the Contract Documents.

B. Plan the work properly.

1. Maintain temperature during and after application. Substrate and ambient air temperature must be between 41 °F (5 °C) and 86 °F (30 °C).
2. Work ahead of the sun on shaded façades to avoid working on hot substrates.
3. Work to logical stopping points (corners, seams, architectural features, etc.).
4. Apply mineral stains as directed by 2.4 FINISHES.
5. Protect from wind and rain prior to, during, and for a minimum 24 hours after application.
6. Obtain manufacturer's written instructions for application outside of the above parameters.

C. Mineral stain:

1. Recall approved product application ratio from Section 1.6 Quality Assurance, B.6.e. Approved Application.
2. First application:
 - a. Prepare base material using approved Application Ratio to determine mixing quantities of mineral stain and dilution.
 - b. Stir well by hand or 600-800 RPM mixing equipment to ensure color is uniform throughout the material. Keep mixture continuously stirred during application.
 - c. Apply base application of prepared mineral stain.
 - d. Allow minimum 24 hours drying time.
3. Second application-if needed:
 - a. Prepare material using approved Application Ratio to determine mixing quantities of mineral stain and dilution.
 - b. Stir well by hand or 600-800 RPM mixing equipment to ensure color is uniform throughout the material. Keep mixture continuously stirred during application.
 - c. Apply top coat of prepared mineral stain.
4. Touch up:
 - a. Transparent stains are difficult to touch up. Some diluted colors touch up well, some do not. Always perform a test and allow the touch up to cure minimum 12 hours before evaluation. Colors become lighter upon drying.
 - b. When possible, use the same tools and techniques from the application for best results.
 - c. Articulate the application confining the touch up to the borders of the repair.

3.4 CLEANING

- A. Clean tools, spills, and accidental drips immediately with plenty of water.
- B. Leave applications clean and premises free from residue and debris from work of this Section.

END OF SECTION