Section: 075610
Ceramic Solar Reflective Roof Coating System

This document is intended to provide only **general** guidelines regarding the application of listed materials as furnished by INSTACOAT PREMIUM PRODUCTS. These general guideline specifications are **NOT** intended as project specific specifications and should not be used as such. The information contained herein may be used, and modified where necessary, by the owner, architect, and contractor in preparing specifications for related restoration projects. It is the responsibility of the owner, architect, and/or contractor to ensure that these general guideline specifications are consistent with the contractual and construction requirements relating to the project.

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fluid applied flexible ceramic/acrylic reflective roof coating over existing roof system. This work will include the preparation, application, and clean up of the reflective roof coating over existing roof system.

B. Fluid applied primer over existing roof system. This work will include the preparation, application, and clean up of the primer over existing roof system.

1.02 SUBMITTALS

A. Prior to the start installation the following submittals shall be made for review and approval.

1. Product Literature and samples.
2. Product MSDS.
3. Manufacturers Installation Instructions.

1.03 CONTRACTOR QUAILIFICATIONS

A. The contractor of the roofing material specified herein shall be an approved contractor. Proof of this qualification shall be provided in written form from the supplier.

1.04 QUALITY ASSURANCE

A. Codes and Standards: The contractor shall make themselves thoroughly familiar with all codes, regulations, and standards governing the work specified.

B. Workmanship: All work shall be installed as indicated and in accordance with suppliers printed instructions.

C. Deviations: There shall be no deviations from the specification or installation instructions unless the deviation is approved in writing by the supplier of the material herein and submitted to the project engineer.

D. Technical Representative: Upon request prior to the commencement of work a supplier's technical Representative shall perform a site inspection during the installation.

1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery
   1. Materials shall be delivered in their original unopened containers, clearly marked. Material shall be stored in clean, dry areas away from direct sun in containers at 50^{o} to 90^{o}F until ready for use.

B. Ordering:

   1. Comply with supplier's ordering instruction and lead-time requirements to avoid construction delays.

C. Safety: Refer to all applicable data, including, but not limited to MSDS Sheets, PDS Sheets, Product Labels, and specific instructions for Specific Personnel Protection Requirements. Applicator contractor must comply with all Federal, State, and local regulations pertaining to safety, environmental protection and other pertinent regulations. Safety equipment must comply with OSHA regulations.

   Applicator should follow the safety precautions listed below:

   1. The work shall be barricaded to prevent pedestrian or vehicular traffic.
   2. The contractor shall provide work access and sight safety practices to avoid endangering the installer, passing public and building tenants.
   3. Avoid contact with eyes and skin; do not ingest or inhale. Prolonged or repeated exposure may cause skin irritation or allergic reactions.
   4. Wear safety goggles, rubber gloves, and appropriate clothing.
   5. Provide safety protection as previously described under General Conditions to protect all occupants, tenants, visitors, etc. during work operations.

D. Storage and Protection

   1. Store and protect materials from harmful weather conditions and at temperatures conditions recommended by manufacturer. Do not allow freezing to occur in storage or shipping. Protect from damage during construction and while stored onsite.

1.06 SITE / SAFTEY PROVISIONS

A. Scaffolding (hanging, stationery swing staging): It will be the responsibility of the Contractor to provide safe, reliable access to the work area to perform the work described herein. The scaffolding and/or work platforms (ladders, etc.) will be provided by, installed, erected, and dismantled by the Contractor.

B. Pedestrian Protection: The Contractor shall supply safety protection for pedestrian/patron egress/ingress to the site during working operations. Protection shall be determined by the site and weather conditions inherent to the work schedule.

C. On-Site Sanitary Provisions: Contractor shall provide for the duration of the project including each mobilization a portable toilet for the use by the Contractor employees.

D. On-Site Supervision and Coordination of Parking Barricades and Access to the Site During the Work Operations

   1. Coordinate work schedule and revisions to patron parking scheme with Superintendent prior to commencement of work operations.
   2. Obtain written approval for work schedule, revised parking scheme, etc. from the Superintendent prior to commencement of work operations.

E. Power and Water Source: Contractor to provide all hoses, hose connections, power cords, extensions and related accessories to connect to water and power source provided by the Owner.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Installation Requirements:

Do not install if:

1. Precipitation is expected within 24 hours after application.
2. Ambient temperatures are below 45° F.
3. Ambient temperature is expected to fall below 32° F within 24 hours of installation.
4. Ambient temperature exceeds 100° F.
5. Substrate temperature exceeds 120° F.

B. Substrate Requirements:

1. Must be sound, dry substrate free from defects.
2. Must have positive slope.
3. Free from ponding water.
4. Free from grease, dirt, or other foreign materials.

1.08 WARRANTY

A. The manufacturer's standard limited warranty provided by IPP warrants specifically against defective materials. If defective materials are found, IPP will provide additional product to re-apply. Specific warranties for labor/workmanship must be provided by installer or by utilization of a performance bond.

B. The Manufacturer also offers material and labor, extended, and leak proof warranties. Contact the manufacturer for more information.

C. MANUFACTURER WARRANTY: Manufacturer must be notified prior to commencement of work what Warranty has been requested by the owner. The installer shall submit manufacturer's "Request for Warranty" and supporting documentation at completion of installation.

PART 2 – PRODUCTS

2.01 GENERAL

Materials are specified by brand name to establish a basis for quality of design and performance requirements and general description of products. Architect will consider substitutions for brand names on a basis of quality of design and performance when reviewed by Architect. This guide manufacturer's specification is written around IPP products and products specified are a standard of quality required for this project.

2.02 PRODUCT NAME AND DESCRIPTION

A. Instacoat Premium Products Performance SL Grade – Rubberized primer.

B. Instacoat Premium Products Flexcoat Base Coat – Elastomeric Reflective roof coating.

C. Instacoat Premium Products Flexcoat Ceramic Coat – Elastomeric Reflective roof coating.

D. Instacoat Premium Products Reinforcement Fabric – Polyester Reinforcement fabric.

2.03 PERFORMANCE REQUIREMENTS

A. PERFORMANCE SL GRADE

TEST	TEST PROCEDURE	RESULTS
Elongation at Break	ASTM-D-3468	>1,000% Max machine stroke reached
Elongation	ASTM-D-412	>1600%
Recovery	ASTM-D-412	>90%
Tensile Strength	ASTM-D-412	208.2psi @ 1001% elongation 1600 psi @ 450% elongation Materials Did Not Fail
Tensile	ASTM-D-413	2000 lbs./ft^2 Up-lift Force
Peel Strength	ASTM-D-903	Materials Did Not Peel
Puncture Resistance	ASTM-E-154	No Puncture
Water Absorption	ASTM-D-570	1.02% Max
Water Vapor Transmission	ASTM-E-96	.08 Grains/Hr/ft^2
Permeance	ASTM-E-96	.46 Grains/Hr/ft^2
Resistance to Hydrostatic Head	Calders Testers Hydro Stand 10-30K	150 PSI
Class A Fire Rating ½": 12	ASTM-E-108-94	Passed
Soil Burial	ASTM-D-4068	Passed
Ash Content	ASTM-D-2939	2.98%
Direct Flame Test	ASTM-D-2939	Passed
Drying Time	ASTM-D-2939	Passed
Extensibility after heat aging	ASTM-C-836	¼ Inch stretch with no cracking
Flash point	ASTM-D-2939	>140°F
High Temp Aging	ASTM-E-240	>300% 48 days @ 176°F
Hydrostatic Pressure	ASTM-C-1306	16.67% over cracks
Low Temp Elongation	ASTM-D-412	>500%
Methane transmission rate	MOCON Multi Tran 400	<5 CC/(m² –day)
Noise Reduction	ASTM-E-1007	98% @ 205 mil
Uniformity	ASTM-D-2939	Pass

Wet Film Continuity	ASTM-D-2939	Pass
Freezing Resistance	ASTM-D-2939	Pass
Heat Resistance	ASTM-D-2939	Pass
Resistance To Volitization	ASTM-D-2939	0.84% Loss
Resistance To Kerosene	ASTM-D-2939	Pass
Residue By Evaporation	ASTM-D-2939	>60%
Resistance To Water	ASTM-D-2939	No signs of Re-emulsification
Puncture Resistance	ASTM-E-154	No Puncture @ Deflection Max machine stroke reached
Impact Resistance	ASTM-D-2939	Pass
Impact Resistance after Accelerated Weathering	ASTM-D-2939	Pass
Salt Fog Exposure	ASTM-B-117	No Deterioration or failure
Peel Strength asphalt	ASTM-D-903	>10 lbf/in
Peel Strength Concrete	ASTM-D-903	>12 lbf/in
Peel Strength Foam	ASTM-D-903	>7.5 lbf/in Substrate failed prior to adhesion failure
Peel Strength Steel	ASTM-D-903	>11 lbf/in
Peel Strength Wood	ASTM-D-903	>11 lbf/in
Peel Strength	ASTM-D-903	Did not Peel

B. FLEXCOAT BASE COAT

TEST	**TEST PROCEDURE**	**RESULTS**
Elongation	ASTM-D-412	315%
Recovery	ASTM-D-412	100%
Tensile Strength	ASTM-D-412	400% 3600% with fabric
Hardness	ASTM-D-2240	45 Shore A
Impact Resistance	ASTM-D-2294	Exceeds 160 in/lb
Algae Resistance	ASTM-G29-96	No Growth
Fungi Resistance	ASTM-G29-96	No Growth
Salt Spray	ASTM-B-117	No effect (3000 hrs)
Permeability	ASTM-E-96	3.4 perms
Weatherability	ASTM-G-26	No effect (3800 hrs)
Service Temperature		-40° to 200° F

C. FLEXCOAT CERAMIC COAT

TEST	TEST PROCEDURE	RESULTS
Elongation	ASTM-D-412	215%
Recovery	ASTM-D-412	100%
Tensile Strength	ASTM-D-412	400% 3600% with fabric
Hardness	ASTM-D-2240	45 Shore A
Impact Resistance	ASTM-D-2294	Exceeds 160 in/lb
Algae Resistance	ASTM-G29-96	No Growth
Fungi Resistance	ASTM-G29-96	No Growth
Salt Spray	ASTM-B-117	No effect (3000 hrs)
Permeability	ASTM-E-96	3.4 perms
Weatherability	ASTM-G-26	No effect (3800 hrs)
Service Temperature		-40° to 200° F

D. INSTACOAT REINFORMCEMENT POLYESTER FABRIC

TEST	TEST PROCEDURE	RESULTS
Weight/Square	ASTM-D-3776	1.1 lbs
Oz/Sq/Yd	ASTM-D-3776	1.6 oz
Dry Tensile Strength-MD	ASTM-D-1777	25 lbs
Dry Tensile Strength-CD	ASTM-D-1777	18 lbs
Elongation-MD	ASTM-D-1682	45%
Elongation-CD	ASTM-D-1682	100%
Mullen Burst	ASTM-D-3786	35 psi

PART 3 – EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

Compliance: Comply with manufacturer's most recently published product technical bulletins including installation instructions, substrate testing, surface preparation, cleaning, and post installation testing.

3.02 PREPARATION

A. Surface Inspection: Prior to commencement of work, a thorough inspection of the substrate should be carried out to determine or confirm the following:

1. A satisfactory surface for application.
2. A positive slope and functioning of the roof drainage system.
3. The substrate i.e. steel to be structurally sound and in good standing for using polyester fabric to fill voids and cracks, must be a smooth surface, free of debris that may damage

the polyester fabric. Care shall be taken not to entrap stones, excessive dust or moisture in the substrate.
4. The soundness and proper detailing of roof mounted supports, penetrations, flashing, outlets, turn-ups, and all other items that are to be a part of the new completed roofing system.
5. The presence of scaling rust, loose joints, or fasteners.
6. If there is an existing coating on the roof: what is the compatibility of the coating and the Products. Compatibility should be determined by spraying a small test area.

2. Substrate Preparation:

1. Pressure washing: Pressure wash substrate to remove all dirt, dust, and remains of previous paint and/or coatings. Pressure washer to have a minimum working pressure of 3,000 psi.
2. Treatment of rust / oxidation: Remove all loose, flaking or powdery rust by wire brushing or pressure washing.
3. Fasteners: All fasteners are to be inspected and re-tightened. All stripped or backed out fasteners are to be replaced with oversize fasteners. Any missing fasteners are to be replaced.
4. All existing roof system consisting of single ply or sheet good membranes shall be cleaned with the appropriate cleaner. Check with the manufacturer for cleaning requirements.
5. Make all necessary repairs to existing substrate. In areas where the existing roof system is not in acceptable conditions:
   a. Any wrinkles or blisters on the roof shall be cut out and patched prior to installation. Check with manufacturer for recommendations.
   b. All wet insulation shall be removed and the deck shall be examined for structural integrity and any necessary repairs shall be made.
   c. Where any ponding water is evident or anticipated shall be address according to manufacturer's requirements.
6. Adhesion test areas: If there is any question as to the adhesion of coating product over suspect areas, such as those that may contain oil residue or those that have been previously coated with a silicone product, a test patch area is required for an adhesion test.
7. Inspection: All preliminary work to be inspected carefully by applicator to insure that all work meets project planned specifications.

3.03 INSTALLATION

A. Performance SL Rubber

1. Apply Performance SL Grade primer at a rate of .9 to 1.3 gallons per 100 square feet in accordance with the requirements of the warranty requested. Allow 12-24 hours drying time. Inspect surface for holidays, flaws or defects and correct all such conditions prior to proceeding to topcoat application. Follow manufacturer's written installation instructions.

B. Flexcoat Base Coat

1. Apply Flexcoat base coat at a rate of 2.6 to 3 gallons per 100 square feet in accordance with the requirements of the warranty requested.
2. Apply reinforcement fabric over entire surface during installation of base coat while still wet. Overlap all seams horizontal and vertical by a minimum of 3-4 inches. Ensure total saturation of the reinforcement fabric.

3. Allow 12-24 hours drying time. Inspect surface for holidays, flaws or defects and correct all such conditions prior to proceeding to topcoat application. Follow manufacturer's written installation instructions.

C. Flexcoat Ceramic Coat

1. Top Coat: Apply Flexcoat Ceramic coat at a rate of 1.5 to 2 gallons per 100 square feet in accordance with the requirements of the warranty requested. Allow 24 hours for drying time and inspect for holidays, flaws or defects and correct such conditions before notification of job completion. Follow manufacturer's written installation instructions.

D. Combined Material Membrane

1. Combined thickness of primer, base coat, reinforcement fabric, and Ceramic coat after curing shall be a minimum of 40 mil.
2. If required thickness has not been achieved contact the manufacturer for recommendations.

NOTE: Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of IPP before proceeding.

3.04 WASTE

A. To minimize waste will result in less of a burden to landfills. Leftover product in containers, which can't be used by the pump and product left in the lines are to be returned to 5-gal pails.

B. All waste of the IPP is to be minimized and disposed of in the correct and proper manner. Follow regulations of the County, State, and local requirements in that area.

3.05 CLEANING

A. Immediately clean surfaces accidentally coated and not scheduled to be coated in accordance with manufacturer's instructions.

B. After installation clean surrounding area and leave as was prior to installation.

3.06 POST INSTALLATION INSPECTION AND QUALITY ASSURANCE

A. It will be the Contractor's responsibility to perform first line inspection of all aspects of the surface preparation and coating application work and to ensure conformance with all pertinent specifications.

B. Contractor shall provide a daily record of all product batch numbers used, application process information, including temperatures, relative humidity, dew point, procedures and inspection data.

C. Proper application is the responsibility of the user. Field visits by IPP personnel are for the purpose of making technical recommendations only, and are not to supervise or provide quality control on the jobsite.

D. Contractor shall monitor the finished system for a minimum of 7 days for proper curing conditions. If proper curing is not being achieved contact the manufacturer for recommendations.

END OF SECTION