SECTION 07560
FLUID APPLIED ROOFING

PART 1 GENERAL

1.1 DESCRIPTION OF EXISTING SUBSTRATES

This specification, in conjunction with the appropriate product technical data sheets, is intended to outline the requirements for application of **UNISIL HS** coating on polyurethane foam insulation or for the recoat of existing silicone coating, when installed over approved roof substrates in acceptable condition.

1.2 DESCRIPTION OF LIQUID APPLIED ROOF COATING

The liquid applied coating consists of a high-solids, VOC-compliant elastomeric silicone coating specifically designed for roofing installation. The coating is to be: 1) Approved by FM Global (FM Approvals); 2) Classified and subjected to follow-up by UL (Underwriters Laboratories Inc.); and 3) Accepted by Miami-Dade County. Additionally, it is listed with CRRC (Cool Roof Rating Council), NSF, EPA/ENERGY STAR, and compliant with CA Title 24 requirements.

1.3 SECTION INCLUDES

A. Fluid applied elastomeric silicone waterproof coating for use over new or existing roofing. Work shall include the preparation of the roof surface, flashing, detailing, application of the roof system, and cleanup.

1.4 RELATED WORK

A. Contractor shall review all sections of the project specifications to determine items of work that will interface with the application of this roof coating. Compliance with applicable building codes shall be assured by the specifier or project engineer, while coordination and execution of related sections shall be the responsibility of the approved contractor.

1.5 REFERENCES

A. NRCA Roofing and Waterproofing Manual
B. Factory Mutual RoofNav Directory
C. Underwriters Laboratories Building Materials Directory
D. Miami-Dade County Product Control Section, Board and Code Administration
E. ASTM D2370 Properties of Organic Coatings
F. ASTM D4798 Accelerated Weathering – Xenon Arc
G. ASTM D6694 Standard Specification for Liquid-Applied Silicone Coating
H. ASTM D471 Water Absorption
I. ASTM E96B Water Vapor Transmission
J. ASTM E108 Fire Test of Roof Coverings
L. ASTM D6694 Specification for Liquid Applied Silicone Coatings
M. ASTM C1549 Solar Reflectance at Near Ambient Temperature Using a Portable

		Solar Reflectometer
N.	ASTM C1371	Emittance of Materials at Near Room Temperature Using Portable Emissometers
O.	FM 4470	Standard for Class 1 Roof Cover for Spread of Flame, Windstorm Pressure, Windstorm Pull, Hail Damage, Resistance to Foot Traffic, and Susceptibility to Leakage

1.6 SUBMITTALS REVIEW

A. Shop Drawings: Submit a scale drawing illustrating layout of joint reinforcing and all flashing details.
B. Product Data: Provide manufacturer's published technical literature, MSDS, and warranty on products that make up the roof covering, including polyurethane foam insulation, elastomeric coatings, flashing materials, roof drains, fasteners, etc.
C. Installation Instructions: Submit all data sheets available from the manufacturers on the installation of the roof covering materials applicable to the project.
D. Submit manufacturer's Certificates of Compliance or Analysis that all products meet or exceed project requirements. Contractor to supply samples or mockup, if required.
E. Applicator is responsible for submitting proof of QCP Preferred Contractor Status.
F. Prior to bid, all project specifications, details, and submittals shall be reviewed by manufacturer for pre-approval and to comply with warranty requirements. Successful bidder should initiate warranty pre-inspection process before commencing work.

1.7 QUALIFICATIONS

A. Applicator Qualifications: The applicator of the roofing material specified herein shall be an approved applicator designated by Quest Construction Products, LLC. Proof of qualification shall be by written certificate from the roofing system manufacturer. Applicator must meet the QCP Preferred Contractor Status Level required for the specified project and warranty requested. 20 year systems warranties are available only to QCP Certified Preferred or Platinum Preferred Contractors. Contact Quest Construction Products for applicator's proof of qualifications.
B. Manufacturer: The coating and foam manufacturers shall have a proven 20-year track record in the production of quality elastomeric acrylic roofing and spray insulation materials, manufactured under an active ISO 9001:2008 & 14001:2004 auditing program.

1.8 QUALITY CONTROL

A. Codes and Standards: The contractor shall become thoroughly familiar with all codes, regulations, and standards governing the specified work. Any contradiction between the manufacturer's requirements and these specifications shall be brought to the attention of the manufacturer(s) and the specifier/project engineer.
B. Deviations: There shall not be any deviations from these specifications unless the deviation is submitted in writing to the specifier/project engineer. Any request for deviation must be approved in writing from the roofing manufacturer's technical department(s) delineating the details of the deviation.
C. At least one individual with current QCP "Preferred Contractor" status shall be on site during

installation of any QCP products. A daily log of application activities and environmental conditions should be maintained and available on-site with copies of technical data/application instructions & MSDS.

D. Manufacturer's Technical Representatives: Manufacturer's Technical Representative is available to make site visits as needed. System warranties will receive a final inspection and that final inspection report is available to the building owner upon request.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to jobsite in manufacturer's unopened and undamaged containers bearing the following information:
   1. Name and address of manufacturer
   2. Identification of contents, with product code
   3. Net volume of contents
   4. Lot or batch number
   5. VOC content
   6. Storage temperature limits
   7. Shelf life expiration date
   8. Mixing instructions and proportions of contents
   9. Safety information and instructions
   10. Appropriate certification markings where applicable: UL, FM, Miami-Dade, & CRRC/ENERGY STAR

B. Store and protect materials from damage and weather in accordance with manufacturers' published instructions.
   1. Ambient temperatures should range between 40° and 110° degrees F (4° to 43° degrees Celsius). Keep out of direct sunlight.
   2. Place stored material containers on pallets and cover with tarpaulin tied to bottom of pallets.

C. Do not apply if ambient temperatures are expected to fall below 40°F (4.5°C), or if rain or heavy dew is anticipated, before liquid coating has cured.

1.10 WARRANTY

A. Upon completion of the roof coating system, the coating and foam manufacturer's representatives, owner's representative, architect and applicator shall make a final inspection to determine the final foam insulation characteristics and thickness, dry film thickness of the fluid-applied acrylic membrane, and to verify that the system meets the manufacturers' requirements for warranty. The contractor shall notify all interested parties in advance of said inspection.

B. Provide Material (Standard) or Labor & Material (System) warranty in accordance with project specs. Contractor shall follow written application process in accordance with manufacturers' program(s).

C. Final dry film thickness of the composite silicone membrane, and to verify that the system meets the requirements for warranty.

D. Provide Material (Standard) or Labor & Material (System) warranty in accordance with project specs. Contractor shall follow written application process in accordance with manufacturer's program. Refer to the following table for surface prep, film thicknesses, and other details.

Table I – Primer chart & UNISIL HS minimum dry film thickness (DFT) values

Existing Roof	Minimum Dry Film Thickness (DFT)					
	Warranty Term Length					
	10-year		15-year		20-year	
	STD	SYSTEM	STD	SYSTEM	STD	SYSTEM
SPF (new)	18	23	23	30	30	35
Silicone (recoat)	18	23	23	30	30	35

PART 2 PRODUCTS

2.1 MANUFACTURER

Quest Construction Products, LLC
1465 Pipefitter Street
North Charleston, SC 29405

Toll Free: (855) 817-3082
Phone: (843) 745-9600
Fax: (843) 745-9602
Web: www.quest-cp.com

2.2 SYSTEM MATERIALS

A. Sprayed Polyurethane Foam Requirements: **(Refer to selected SPF manufacturer's technical data sheets for specific physical characteristics and performance properties, as well as proprietary application details for existing/recoat conditions or new installation.)**

B. Waterproofing Coating: **UNISIL HS** is a high-solids, VOC-compliant elastomeric silicone coating that forms a seamless, weatherproof, fire-resistant membrane over properly prepared new polyurethane and existing silicone roof surfaces. Total dry film thickness shall range from 18 to 35 mils, depending upon the substrate texture and warranty duration required. Appropriate accessory products are utilized to complete the application (refer to Table 1 for details).

C. Cured Membrane Characteristics:

ASTM D-6694 Material Properties		
Property	**Method**	**UNISIL HS**
Ultimate Tensile Strength	ASTM D412	331 +/- 25 psi (2.3 MPa) @73°F (23°C)
Elongation @ Break	ASTM D412	192% +/- 10 @73°F (23°C), initial 202% +/- psi @73°F (23°C) after 5000 hours weathering
Tear Resistance	ASTM D624	37.5 lbf/in
Low Temperature Flexibility	ASTM D522-B	Pass @ -15°F (-34°C)
Accelerated Weathering	ASTM D822/G23	Passed 5000 hours exposure
Permeance	ASTM E96B	5.1 Perms @ 30 mils

Additional Properties		
Property	**Method**	**UNISIL HS**
Hardness	ASTM C661	45-55 Shore Type A
Temp Limits for Service		-80 to 350°F (-62 to 177°C) @ surface
General Performance	ASTM D6694	Fully compliant
Fire Rating	UL790/ASTM E108	UL 790 Class A, FM Class 1 and ASTM E-108
Water leakage	ASTM D7281	Pass
Moderate Hail	FM 4470 4.4	Pass
Resistance to traffic/Impact	FM 4470 4.6	Pass

2.3 ACCESSORY MATERIALS (Refer to individual product technical data sheets, which are an integral part of this specification, for properties & installation.)

A. **UCC:** Non-toxic concentrated cleaning agent for roofs, walls, and decks
B. **Acrylex 400:** Single-component acrylic primer to provide corrosion resistance and promote bond to metal surfaces
C. **Lock-Down:** Single-component solvent based rust inhibitive metal primer
D. **Uniseal:** Single-component epoxy primer/sealer for concrete and other porous surfaces
E. **Acrysheen**: Water-based penetrating sealer for porous substrates; clear finish to rejuvenate acrylic & fiberglass skylight panels

PART 3 EXECUTION

3.1 EXAMINATION

A. All surfaces shall be clean and dry, free of any dirt, dust, gravel, oil, surface chemicals or other contaminants that may interfere with optimum adhesion of foam and/or waterproof coating. Verify that substrates are structurally sound and stable, free of cracks, pits, or projections that could interfere with proper application and performance of foam insulation and/or waterproof coating.
B. Verify that all existing surfaces are smooth and not detrimental to full contact bond of waterproofing recoat materials.
C. Verify items that penetrate surfaces to receive waterproofing system are securely installed and suitably flashed.
D. Verify that substrate areas are adequately supported and firmly fastened in place.
E. Verify that roof deck has a minimum slope of 0.25 inch / foot (2.08 cm/meter), and that positive drainage is assured. Ponding water present 48 hours after rainfall is unacceptable, as is a substrate moisture content of 15% or greater. Existing SPF that exhibits cracking, delamination, UV degradation, or moisture intrusion/saturation must be scarified or removed and replaced to restore an even plane with the original surface.
F. Verify that all contiguous walls are correctly flashed and waterproofed.

3.2 PREPARATION - GENERAL

A. Protect adjacent surfaces not designated to receive foam and/or coating.

B. At a minimum, clean and prepare surfaces to receive foam and/or coating by removing all loose and flaking particles, grease and laitance with the use of a stiff bristle push broom and/or washing with UCC. Care should be taken not to inject water into the substrate during washing. Allow adequate time for complete drying after the cleaning process. Inspect and make all necessary repairs to substrate. Seal cracks and joints with sealant materials using depth to width ratio as recommended by sealant manufacturer. Contact a Quest Construction Products (QCP) Technical Rep for technical assistance if needed.

C. Do not apply foam and/or coating to surfaces unacceptable to manufacturer(s), or under inclement environmental conditions.

3.3 APPLICATION

A. Polyurethane foam components shall be metered and sprayed **in strict accordance with the foam manufacturer's directions and specifications. Refer to specific product literature for details.** Polyurethane foam shall **not** be sprayed during inclement weather or when the following conditions exist:

1. If surface temperature is above 120°F (49°C) or below 35°F (2°C), or when the dew point is less than 5°F (3°C) above the surface temperature (temperature shall be measured with a surface thermometer). For surface temperatures between 35°F and 50°F (2°C and 10°C), special catalyzed foam with short cream time must be used.
2. If surface moisture is present, or where moisture meter readings are in excess of 10% (this may vary slightly depending on geographic location).
3. If wind velocity is above 12 miles per hour (unless adequate windscreens are provided).
4. If relative humidity is above 80%.

The finished surface texture of the applied polyurethane foam shall range from a smooth to a medium "orange peel" finish. **Surface textures defined as "popcorn" or "tree bark," or surfaces that exhibit crevices, voids or pinholes are not acceptable.**

B. **UNISIL HS** shall be applied within 72 hours of the foam installation to prevent surface oxidation that would interfere with coating adhesion. **Refer to separate UNISIL HS Technical Data & Application Instructions sheet for additional details on equipment and coating process.**

C. To qualify for the 10-**Year Standard Warranty Program,** the following requirements shall be adhered to:

1. **UNISIL HS** shall be applied in two (2) separate coats at a minimum total of 1.5 gallons per 100 sq. ft. (.6 l/m²). Contrasting colors are recommended for each coat to ensure positive, uniform coverage.
2. This coverage rate will theoretically result in 22.4 mils dry (569 microns). The nominal total dry film thickness required to qualify for QCP's **10-Year Standard Warranty** shall be 20 mils (508 microns), with a minimum dry film thickness at any location of 18 mils (457 microns).

To qualify for the **15-Year Standard** or 10-**Year System Warranty Program**, the following requirements shall be adhered to:

1. **UNISIL HS** shall be applied in two (2) separate coats at a minimum total of 2 gallons per 100 sq. ft. (.8 l/m²). It is recommended that contrasting colors be used for each coat to ensure positive, uniform coverage.
2. This coverage rate will theoretically result in 29.8 mils dry (757 microns). The nominal total dry film thickness required to qualify for QCP's **15-Year Standard** or **10-Year System Warranty** shall be 26 mils (660 microns), with a minimum dry film thickness at any location of 23 mils (584 microns).

To qualify for the **20-Year Standard** or **15-Year System Warranty Programs**, the following requirements shall be adhered to:

1. **UNISIL HS** shall be applied in a minimum of two (2) separate coats at a minimum total of 2.5 gallons per 100 sq. ft. (1.0 l/m²). It is recommended that contrasting colors be used for each coat to ensure positive, uniform coverage.
2. This coverage rate will theoretically result in 37.3 dry mils (947 microns). The nominal total dry film thickness required to qualify for QCP's **20-Year Standard** or **15-Year System Warranty** shall be 33 mils (838 microns), with a minimum dry film thickness at any location of 30 mils (762 microns).

To qualify for the **20-Year System Warranty Program**, the following requirements shall be adhered to:

1. **UNISIL HS** shall be applied in a minimum of three (3) separate coats at a minimum total of 3 gallons per 100 sq. ft. (1.2 l/m²). It is recommended that contrasting colors be used for each coat to ensure positive, uniform coverage.
2. This coverage rate will theoretically result in 44.7 dry mils (1,135 microns). The nominal total dry film thickness required to qualify for QCP's **20-Year System Warranty** shall be 39 mils (991 microns), with a minimum dry film thickness at any location of 35 mils (889 microns).

D. **On recoat applications, UNISIL HS** shall be applied as soon as UCC cleaning process is complete and surface is dry. Should contamination reoccur in the interim, the surface should be swept or blown clean before commencing with recoating. **Contact a Quest Construction Products (QCP) Technical Rep for special instructions and required dry film thickness needed for warranty extension for the particular project.**

E. **UNISIL HS** topcoat shall extend up and over all roof substrates on vent pipes, parapets and other protrusions to terminate a minimum of 3" (8 cm) above the substrate, creating a self-terminating flashing, and to provide an aesthetically pleasing appearance.

F. To provide a non-skid walk path on roofs subject to heavy foot traffic, demarcate walkways by applying an additional coat of **UNISIL HS** topcoat using a medium-nap roller or airless spray, at the rate of .5 gallon per 100 sq. ft. (.2 l/m²) along the designated traffic area. While the coating is still wet, broadcast 3M #11 ceramic roofing granules to the point of refusal. Breathable walk pads, such as "Yellow Spaghetti," can also be used to demarcate walkways.

3.4 PROTECTION OF FINISHED WORK

A. Monitor finished system for seven days, sweeping off any birdbaths to allow for full cure.

3.5 CLEANUP

A. Immediately clean unscheduled surfaces receiving waterproofing in accordance with manufacturer's instructions. Maintain work and work areas in a clean, safe condition at all times during coating installation. Remove excess materials, trash and debris from the jobsite daily.

B. At the completion of the project, clean area of any spills and containers, and clean up all roofing debris, leaving jobsite in a clean and orderly condition.

C. Refer to project specifications and manufacturer’s published requirements for minimum application rates to meet desired warranty duration and coverage.

END OF SECTION