

SECTION 07500

UNIFLEX SILICONE ROOF COATING SYSTEM GUIDE SPECIFICATION FOR NEW SPRAY POLYURETHANE FOAM (SPF) ROOFING

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Provide labor, materials, equipment, and supervision necessary to install NCFI Polyurethanes' Spray-Applied Polyurethane Foam (SPF) and Uniflex spray-applied silicone coating system as outlined in this specification to create a seamless waterproof roofing system.
- B. Any instructions on the Coating Manufacturer's Product Data Sheets are to be considered part of these Specifications and should be followed in any performance of the work.
- C. Any instructions on the SPF Manufacturer's Product Data Sheets are to be considered part of these Specifications and should be followed in any performance of the work.
- D. Additional details and specific areas of repair may be selected, modified, or added as necessary.

1.2 RELATED WORK

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division 01 Specifications, apply to this section.
- B. Contractor shall review all sections of the project specifications to determine items of work that may interface with the application of the roof coating system. Compliance with applicable building codes shall be assured by the specifier or engineer, while coordination and execution of related sections shall be the responsibility of the Contractor.

1.3 REVIEW / SUBMITTALS

- A. Prior to bid, all project specifications, details, submittals, photographs, inspection reports and existing substrate conditions shall be provided to Manufacturer for review and pre-application warranty approval.
- B. At the time of bidding, the Contractor shall submit to the Owner the following:
 - 1. A certificate or letter from the Manufacturer approving the Contractor in good standing for application of the Manufacturer's products and systems at the time of the work.
 - 2. Provide cured sample of products to be installed.
 - 3. The Manufacturer's standard details and approved shop drawings for the coating system.
 - 4. Product and Material Safety Data Sheets for each product indicated in this Specification.
 - 5. Sample copy of Manufacturer's warranty to be issued upon successful completion of the project.
 - 6. Sample copy of the Contractor's warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall have a minimum of 20 years' experience manufacturing roof coatings and be ISO 9001:2008 Certified.
- B. The contractor shall be approved by Uniflex and NCFI Polyurethanes to apply the system. Manufacturer's written verification of applicator approval is required.
- C. Products listed herein shall be provided by a single manufacturer or approved by the primary roofing Manufacturer for compatibility.

- D. Contractor represents and warrants that it is experienced in and qualified to perform the work described herein and can provide the necessary equipment, supervision, and trained workforce capable of completing the work in a safe, prompt, diligent, professional, and workmanlike manner and in accordance with all federal, state and local laws, rules and regulations, this Specification and good roofing practice.
- E. Contractor shall be thoroughly familiar with all codes, regulations and standards governing the work to be performed and shall provide written proof of all required licenses and permits prior to project commencement.
- F. Contractor shall be approved by Manufacturer for application of Manufacturer's products and systems and in good standing at the time of the work and shall coordinate with Manufacturer prior to bidding and commencement of work regarding any Manufacturer's warranty to be issued upon successful completion of the project.
- G. Contractor shall inspect the project to examine the actual job and site conditions and must be familiar with local conditions and all things required to complete the work that will have a bearing on its costs and completion.
- H. All substrates must be peel tested for adhesion strength and those results provided to Manufacturer prior to application of the coating system.
- I. Contractor is responsible for ensuring a trained foreman is onsite during the application of the coating system and any related work. A daily log of application activities and environmental conditions shall be maintained and available on-site with copies of specification, TDS, and MSDS. A copy of the activity log shall be submitted to Manufacturer upon completion of project.
- J. Contractor shall check wet film thickness during application of the coatings to ensure achievement of required coverage rates.
- K. In the event Contractor finds that performance or completion of the work will be delayed for any reason, Contractor shall notify the Owner, the Owner's Representative and Manufacturer in writing as soon as possible.
- L. There shall be no deviations made from the Specifications unless submitted in writing by the Contractor and approved in writing by the Specifier, Owner, and Manufacturer.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Products shall be delivered to jobsite in Manufacturer's original unopened and undamaged containers bearing Manufacturer's original labels. Package labels must be clearly visible on pallets. Verify products are within Manufacturer's recommended shelf life.
- B. Store all products in a dry, well ventilated, weather tight location at temperatures between 40° F and 100° F. Do not store products at higher temperatures or in direct sunlight. Protect all products from freezing or other damage during transit, handling and storage. Store and handle products in a manner that will ensure there is no possibility of contamination. Keep lids tightly sealed when not in use. Do not stack pallets more than two (2) high. If these storage conditions are not possible, special consideration in storage must be taken.
- C. Do not subject existing roof to unnecessary loading of stockpiled products or other materials.
- D. Record batch numbers in daily project activity log. Submit to Manufacturer upon project completion.
- E. Store and dispose of all products and materials used on the project in accordance with all federal, state and local requirements for the proper handling and disposal of such products and materials.

1.6 PROJECT CONDITIONS

A. Condition of Existing Substrate:

1. The Owner, Owner's Representative and Contractor shall thoroughly inspect and determine the condition of the roof system and substrate to be coated, and the suitability of the roof system for the application and performance of the coating system.
2. All surfaces and substrates which are to be coated must be properly prepared, clean, dry, structurally sound and free from any moisture, dirt, contaminants or any other conditions which may interfere with the application and performance of the coating system. Contractor shall approve the condition of the roof system and substrate prior to application of the roof coating system.
3. Deteriorated or damaged decking or other materials must be removed and replaced before application of the coating system.
4. The NRCA recommends that all roofs be designed and built to have positive drainage. Any questions or concerns about deck deflection as a result of ponding water conditions shall be directed to a competent and properly licensed design professional. Coating may require additional inspection and maintenance (including cleaning and re-coating) during the warranty period depending on environmental conditions.
5. If any unusual, unexpected, or concealed conditions are discovered at any time prior to or during the work, the Contractor shall stop work immediately and notify the Owner, Owner's Representative and Manufacturer in writing as soon as possible.

B. Protection and Coordination:

1. Owner will occupy the premises during the work. Contractor will cooperate with the Owner to allow for the continued use of the facilities during the work.
2. Contractor shall take all necessary precautions when using roof coatings or other materials around air intakes and air conditioning units to avoid any disturbance, including odors, for the Owner and building occupants. All air intakes and air conditioning shall be adequately protected or closed during the course of the work on the roofing system to prohibit odor intake into the building.
3. If ventilators exist on the roof, the Contractor shall determine what material is being exhausted onto the roof surface. Contractor shall contact the Manufacturer to determine if the exhaust materials will interfere with surface preparation, application, adhesion, or other performance of the coating system.
4. Contractor shall take all necessary measures to protect unrelated work or adjacent areas from overspray and spillage.
5. Contractor shall coordinate scheduling with the Owner to relocate or protect vehicles, building occupants, building contents and unrelated work from damage.
6. Site cleanup during and after completion of the work shall be completed to Owner's reasonable satisfaction.

1.7 PRE-APPLICATION CONFERENCE

- A. Prior to scheduled commencement of the coating application and any related work, Contractor shall conduct a meeting on the roof with the Architect, Owner, Manufacturer and any other persons directly involved with the performance of the work. The Contractor shall record conference discussions to include decisions, agreements, and open issues and furnish copies of recorded discussions to each attending party. The primary purpose of the meeting is to review methods and procedures related to the roofing work and Special Owner requirements.
- B. All parties shall view representative areas of the roofing substrate and discuss conditions of the substrate, penetrations, and any other work to be completed prior to application of the coating system.
- C. Review roofing system requirements, specifications, detail drawings, Contract Documents and required submittals, both completed and in progress.
- D. Review and finalize the construction schedule related to roofing work, and verify availability of materials, Contractor's personnel, equipment, and facilities needed to consistently make progress and avoid delays.
- E. Review results from Contractor's inspections, adhesion, and non-destructive testing.
- F. Review forecasted weather conditions expected. Establish procedures for coping with unfavorable conditions, including the possibility of temporary roofing work.

1.8 WARRANTY

- A. Project warranties beyond those found on Product Data Sheets require Manufacturer approval prior to job commencement. Any warranties for the project must be submitted and accepted by the Owner at the time of contract award. Please contact Manufacturer for any requirements and associated costs or fees which may be associated with warranty issuance. Recommendations and requirements are subject to change from project to project based on existing conditions.
- B. Manufacturer may issue to the Building Owner either a Material Only Warranty or a Systems Warranty, as may be agreed to at time of contract award. Any warranties issued shall be for the Uniflex coating application only and shall not provide coverage for the existing roofing system, including the substrate or structural deck. Any presence by Manufacturer personnel on the project does not provide any additional coverage beyond that stated in the applicable warranty.
- C. The Contractor may provide the Owner with a workmanship warranty as may be agreed to by the Contractor at time of contract award.

1.9 REGULATORY AND SAFETY

- A. Contractor will perform all work in a safe, professional, timely and workmanlike manner and in accordance with all federal, state and local laws, rules and regulations related to the work to be performed hereunder, the Specifications and good roofing practice.
- B. Contractor shall be thoroughly familiar with all codes, regulations and standards governing the work to be performed and shall provide written proof of all required licenses and permits prior to project commencement.
- C. Contractor shall establish and enforce a safety program for its work and employees which meets or exceeds all federal, state and local laws, rules and regulations, including proper fall protection and all other applicable requirements of the Occupational Safety and Health Act of 1970 (OSHA), and all other requirements which may be necessary for the safety of its employees, Owner and the public.

PART 2 – PRODUCTS

2.1 GENERAL

Products other than those described in Part 2 may be submitted for review and acceptance by Manufacturer. Manufacturer's review shall be for compatibility purposes only with Manufacturer's products. The specifications and application instructions for products not supplied by Manufacturer must be reviewed by the Owner and/or Owner's Representative for final approval and use on the project. Manufacturer will not provide any warranty coverage for products other than those supplied by the specified Manufacturer.

2.2 ACCEPTABLE MANUFACTURERS

- A. Uniflex Fluid Applied Roof Coatings, 101 W. Prospect Avenue, Cleveland, Ohio 44115
- B. NFCI Polyurethanes, 1515 Carter Street, Mount Airy, NC 27030
- C. Contact the Uniflex Technical Department at uniflex.technical@sherwin.com with any questions and for a complete list of approved products.

2.3 COMPONENTS

- A. Spray Polyurethane Foam (SPF) 10-011
 - 1. NFCI 2.8# HFO or HFC SPF
- B. Silicone Roof Coating:
 - 1. Uniflex® Silicone 44 White 44-300/44-600
- C. Sealants:
 - 1. Uniflex® 58-360 Pitch Pan Sealant

D. Additional Materials:

1. Walkways (Optional)
 - a) #11-C93 granules or similar (.84 to 2.0 minimum size)

PART 3 – EXECUTION

3.1 INSPECTION AND TESTING

- A. All roof system areas shall be inspected for moisture in accordance within the guidelines of the Standard Practices for Moisture Surveying of Roofing and Waterproofing Systems by a person qualified and certified to provide proper interpretation of non-destructive moisture Survey data, requires knowledge of infrared theory, moisture migration, heat transfer, environmental effects, and roof construction as they apply to roof moisture analysis.
- B. Based on Contractor's inspection and testing, a roof plan shall be made to show all areas of water intrusion, ponding water, wet insulation, and any deteriorated or damaged decking or other materials.
- C. Contractor shall verify a minimum roof slope of 1/4 inch per foot and that all roof drains are clean and in good working order.
- D. Prior to application of the coating system, Contractor shall perform and document adhesion testing over substrates including previously coated and non-coated roof membranes.
- E. If any unusual, unexpected, or concealed conditions are discovered at any time prior to or during the work, the Contractor shall stop work immediately and notify the Owner, Owner's Representative and Manufacturer in writing as soon as possible.

3.2 PREPARATION

- A. Prior to SPF application, all existing non-embedded gravel surfacing material shall be removed by means of a stiff bristle street broom, powered mechanical sweeper, or vacuuming. All loose dirt and dust remaining after gravel removal must be broomed and/or vacuumed from the roof all blisters, ridges and other imperfections must be secured so that the surface will be clean and dry and a secure base for SPF application.
- B. For application over existing roofing contractor shall remove and replace any wet insulation and deteriorated or damaged decking or other materials with like kind or better-quality materials.
- C. Existing low areas where water ponds and areas with obviously poor drainage to roof scuppers, drains, or roof edges should be corrected by filling and/or tapering the sprayed foam or by adding drains. To prevent the ponding of water, the entire system must be well sloped into drains. Install additional drains as necessary.
- D. Priming may be required on some substrates. Consult Uniflex for specific recommendations.
- E. Prior to power washing, Contractor shall repair all open seams in the roof system and flashings, and any other conditions affecting the water tightness of the roof. The roof system must be made sound and watertight. All repairs shall be made in accordance with NRCA guidelines and good roofing practice. Upon written request, Manufacturer can provide additional repair details.
- F. Any mechanical equipment and roof penetrations including stacks, vents and pipes must be securely installed, properly sealed and made completely watertight, and any abandoned pipes and vent stacks shall be removed, and holes filled in and roofed with like decking, insulation and membrane, all in accordance with NRCA guidelines and good roofing practice. Upon written request, Manufacturer can provide additional repair details.
- G. Pitch Pans: Remove one (1) inch of old weathered material, fill and trowel to create a slight slope with Uniflex 58-360 Pitch Pan Roofing Sealant.
- H. Contractor shall secure and seal all loose metal in accordance with NRCA guidelines and good roofing practice. Upon written request, Manufacturer can provide additional repair details.

- I. All skylights must be sealed and made watertight in accordance with NRCA guidelines and good roofing practice. Upon written request, Manufacturer can provide additional repair details.
- J. Surface Cleaning: (Existing Substrates)
 1. Contractor shall first remove any dirt or debris from the roof by using a broom or air broomer.
 2. After brooming and prior to power washing, Contractor shall re-inspect the roof surface and flashings for any splits, open seams, tears, cuts and blisters in membrane and any other conditions affecting the water tightness of the roof. The membrane shall be repaired so water is not injected into the membrane during the cleaning process.
 3. The roof shall be power washed using a power washer with greater than 2,000psi. The Contractor shall take caution not to inject water into the roofing substrate.
 4. Any areas of algae, mildew or fungus on the roof membrane or the existing coating shall be treated with a tri-sodium phosphate (TSP) or equivalent non-filming detergent and water solution.
 5. Clear water rinse until all cleaning residue is removed.
 6. After cleaning and rinsing the roof, Contractor should ensure that no dirt, debris or contaminants are present that may interfere with proper adhesion of the coating system.
 7. Contractor shall allow 24-48 hours for complete drying before application of the coating system.
 8. All substrates must be dry and in accordance with Roof Coating Manufacturer's published literature prior to installation of roof coating. It is the responsibility of the building owner or their representative to ensure substrate is dry and in acceptable condition for the application of a roof coating.
- K. Equipment Supports:
 1. Inspect and replace deteriorated or damaged wood sleepers.
 2. Raise all sleepers to allow for SPF/coating application.
- K. Expansion Joints and Control Joints:
 1. Replace the joint if deteriorated with a new expansion joint system.

3.4 WEATHER CONDITIONS & TEMPERATURE REQUIREMENTS

- A. Contractor shall proceed with roofing work only when the existing and forecasted weather conditions and surface temperatures will permit work to be performed in accordance with Manufacturer's recommendations and good roofing practice, including:
 1. Ambient air temperature must be 50°F and rising, but not above 120°F during the entire application and curing process.
 2. Surface temperatures must be between 50°F and 150°F during application. If surface temperatures exceed 150°F during application, wait for roof to cool.
 3. Ambient humidity must be monitored before and during the application of SPF with a psychrometer. Wet bulb measurements must not exceed the maximums for a given dry bulb measurement as defined by NCFI's Applicator Bulletin on Wet Bulb/Dry Bulb Thermometer. Wind speeds should not exceed 15 mph. To avoid overspray, wind screens are recommended.
 4. Contractor must provide a completed Uniflex SPF Checklist for each day that SPF application occurs. Warranties will not be considered for projects lacking the necessary checklists.
 5. Never apply materials to a wet or damp surface. Application surface must be free from any moisture with no precipitation in the forecast until coating is dry. Do not apply coating if weather does not permit 4-6 hours of dry time prior to precipitation. Low humidity, low temperatures, cloud cover and calm air will slow the dry time.
 6. Extra precaution is needed when applying material in windy conditions. Never spray material when excessive wind conditions exist. Contractor should monitor wind condition to prevent

over-spray. If winds become excessive, spraying should stop.

3.4 APPLICATION

A. General:

Surface preparation is critical prior to application of the coating system. Contractor shall ensure that all surfaces and substrates which are to be coated have been properly prepared and are clean, dry, structurally sound and free from any moisture, dirt, contaminants or any other conditions which may interfere with the application and performance of the coating system.

B. Protection and Start-Up Procedures:

1. Contractor shall only apply coating when the existing or forecasted weather conditions and surface temperatures will permit work to be performed as described in Section 1.8.
2. Owner shall be notified of start times so that fresh air intakes may be closed, sealed off or adequately protected and HVAC units shut down.
3. If Contractor is spray applying the coating system, Contractor shall post notices a minimum of 48 hours around building and parking lots prior to any spraying.
4. Contractor shall protect unrelated work and adjacent surfaces from overspray or spillage by using masking tape, plastic/paper sheets, stretch wrap, tarps or plywood, or some other material.
5. Contractor shall remove drain screens and seal the drainpipe to prevent plugging of drain during the coating operation, and shall unplug drains and reinstall screens after spray operation has been completed.
6. Contractor shall follow all of Manufacturer's mixing instructions for the products prior to application.

C. Spray Polyurethane Foam (SPF)

1. Minimum Application Thickness:
 - a. 10 Year Warranty 1.5 inches
 - b. 15 Year Warranty 1.75 inches
 - c. 20 Year Warranty 2.0 inches
2. Fill all low areas with SPF as required to achieve proper water drainage. The SPF should be applied in a manner to complement existing drainage and to eliminate the accumulation of water.
3. To all properly prepared surfaces, apply the SPF in pass thicknesses between ½ and 1.5 inch per lift to reach the absolute minimum required thickness listed in Table 3. Total thicknesses may be greater, but not less than specified. Flash passes of less than ½ inch are not acceptable.
4. When spraying to foam boards, make sure they are properly attached with fasteners or adhesive. If there is more than one layer of insulation board, make sure the joints are staggered to increase insulation efficiency and structural stability. Never spray to XPS (Extruded Polystyrene) board as spray foam will not adhere well to the substrate.
5. Extend foam up walls, around pipes, and other projections a minimum of 4 inches. The top edge of the foam shall extend all the way up the parapet wall.
6. In areas where obstacles do not permit normal spray techniques and the application tolerance specified above cannot be met, the contractor shall still apply the specified minimum thickness of foam required by a method that he shall select and is approved by the manufacturer. However, the completed application of foam shall be monolithic with adjacent areas of normal application.
7. Apply foam so that the finished surface is smooth and free of voids, pinholes, and crevices with a maximum allowable roughness defined as "coarse orange peel", "Treebark", or "popcorn" surfaces are not acceptable. Foam thickness should be checked throughout the duration of the project with a Pin-gauge or similar gauge designed to measure Foam thickness.
8. The foamed roofs drainage should be checked after a rain for ponding water (½ inch or more of water in a single 100 ft² area). Drainage channels can be cut using a rotary wire brush, or other suitable device, to eliminate standing water. Other sources of standing or steady water, such as air conditioning condensation or cooling tower drippage, must be eliminated from the roof surface by plumbing to drain or other suitable means.
9. **SPRAYING FOAM ON COAL TAR ROOFS:** Coal tar used in roofing will soften substantially when heated, even on older roofs. When spraying foam onto coal tar roof surfaces, it's important that heat build-up

due to the polyurethane foam reaction exotherm be minimized. Excessive heat build-up could result in delamination between the foam and the existing built-up roof surface or between the built-up roof plies. Therefore, when applying foam to coal tar roofs, spray the first foam pass $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in thickness and allow the first pass to cool for 15 min. before applying additional foam passes.

10. Allow installed SPF to cure a minimum of 2 hours prior to applying coating.
11. Coating must be applied the same day as the SPF installation.

D. Silicone Roof Coating Application

1. Airless spray equipment with a recommended minimum air pressure of 5,000 psi at the tip and a tip size of .031 - .035 (e.g. .635 tip) is recommended for best results.
2. Contractor shall frequently verify correct mil thickness by the use of a standard wet mil gauge during application of the coating.
3. During application of the coating, Contractor will look for and correct any pinholes, blisters or conditions which may affect the performance of the roof coating.
4. Minimum Application Rates
 - a. 10 Year Warranty- 1.5 gallons per square (24 Wet mils; 23 DFT)
 - b. 15 Year Warranty- 2.0 gallons per square (32 Wet mils; 30 DFT)
 - c. 20 Year Warranty- 2.5 gallons per square (40 Wet mils, 38 DFT)

E. Walkways (Optional)

1. Prior to walkway surfacing allow coating system to cure for a minimum of 24 hours.
2. Tape off walkway areas to create straight lines.
3. Apply additional roof coating in a contrasting color at a minimum of Sixteen (16) wet mils at traffic areas.
4. Apply #11-C93 granules uniformly into wet coating at a rate of 25 pounds per 100 square feet.
5. Allow roof coating to cure.
6. Remove loose particles to avoid clogging drains.

F. Traffic areas

1. Cured coatings can be slippery. Limit pedestrian traffic to designated walkways.

3.5 FIELD QUALITY CONTROL

- A. Limit traffic on coated surfaces for a minimum of two (2) days.

B. Final Observation and Verification:

1. Contractor shall contact Uniflex for warranty issuance requirements.
2. Prior to demobilization from the site, a final inspection of the roof coating system shall be carried out by the Owner's Representative and Contractor.
3. Inspection by Uniflex may required for issuance of the final project warranty depending on warranty type. Any inspection by Uniflex is for Uniflex warranty purposes only and shall not constitute acceptance of or responsibility for any improper workmanship by Contractor.
4. Any defects and non-compliance with the Specifications, Product Data Sheets or recommendations of Uniflex shall be itemized in a punch list. These items must be corrected by the Contractor to the satisfaction of the Owner and Uniflex prior to demobilization. Failure to satisfactorily complete punch list items will result in non-issuance of the project warranty.
5. Any areas of insufficient coating thickness will require recoating by Contractor.
6. The roof coating system must be fully adhered to the roof substrate. Any voids left under the system must be corrected.
7. All work for Uniflex warranty must be completed using Uniflex materials. Material invoices must be submitted to Uniflex to verify products installed.
8. To maintain warranty eligibility and coverage, Owner must follow all inspection and maintenance requirements described in the Uniflex Owner's Packet.

3.6 JOB SITE CLEAN UP

- A. Remove all roofing related trash and debris from jobsite and dispose of all such materials in accordance with all federal, state and local requirements for the proper handling and disposal of such materials.

Table 2. Maximum Wet Bulb Readings for Given Dry Bulb Reading (°F)											
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
40	35	50	45½	60	55½	70	65½	80	73½	90	79½
41	36	51	46½	61	56½	71	66½	81	74½	91	80
42	37½	52	47½	62	57½	72	67½	82	75	92	80½
43	38½	53	48½	63	58½	73	68	83	75½	93	81
44	39½	54	49½	64	59½	74	69	84	76	94	81½
45	40½	55	50½	65	60½	75	70	85	77	95	82
46	41½	56	51½	66	61½	76	70½	86	77½	96	82
47	42½	57	52½	67	62½	77	71½	87	78	97	82½
48	43½	58	53½	68	63½	78	72	88	78½	98	82½
49	43½	59	54½	69	64½	79	73	89	79	99	83
										100	83

Uniflex does not practice or provide any architecture or engineering services. If an Owner has a need for architectural or engineering services in relation to the project, the Owner should obtain the services of a competent and properly licensed architect or structural engineer. Neither Uniflex nor its employees offer any opinion or make any representation or warranty, and expressly disclaims any opinion, representation, or warranty, on the strength or soundness of the structure, including the roof deck. Any inspections of the roofing system by Uniflex or its employees are for suitability of the substrate for roof coating application and for warranty issuance purposes only.

END OF SECTION