

Cool Roof Coat

Application & Technical Manual



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Cool Roof Coat Application & Technical Manual

Welcome Message

For the waterproofing and roof restoration market, **NanoTech Materials Cool Roof Coat** offers an alternative to traditional roof replacement and restoration methods, with heat rejection properties that exceed those of any other protective roof coating on the market. As a high-performance, elastic polymeric protective coating, ASTM tested to Miami-Dade County standards, NanoTech Materials Cool Roof Coat stands up to the most grueling weather conditions, making it a long-lasting alternative to full roof replacement with the added benefit of unprecedented energy efficiency for the building.

About NanoTech Materials

NanoTech Materials, Inc. has revolutionized the science of heat control by integrating its novel Insulative Ceramic Particle™ into common building materials, coatings, and substrates to give them industry-breakthrough heat conservation, rejection, or containment properties. NanoTech products include heat-rejecting roof coatings for buildings, heat-containment fireproofing coatings to protect critical infrastructure from wildfires, and specialized ceramics to contain extreme heat in industrial applications.

NanoTech's Cool Roof Coating represents a paradigm shift in roof technology, going beyond the standard Solar Reflectance Index (SRI) metrics by incorporating its Insulative Ceramic Particle™ to significantly reduce heat transfer.

Disclaimer

NanoTech Materials specializes in the manufacturing and distribution of roofing materials and is not engaged in architecture or engineering services. NanoTech Materials bears no responsibility for the performance of its products in cases where damage is attributed to factors such as improper building design or construction defects.

The responsibility for design remains with the architect, engineer, roofing contractor, or owner. The construction details provided in this manual serve as guidance and should not be interpreted as exhaustive. They are not a substitute for sound application practices.

The information presented in this manual is offered in good faith and, to the best of NanoTech Materials' knowledge, does not infringe upon any patents, whether domestic or foreign.

NanoTech Materials continuously strives to enhance the performance of its products and periodically updates its products and application specifications. The company retains the right to modify, at its discretion, any of the information, requirements, specifications, or policies provided herein. This manual supersedes all previous catalogs and manuals.

1.0 Substrate Preparation

General Substrate Conditions

Preparation of the roof is the duty of the installer, who is tasked with identifying and rectifying all conditions outlined in this section.

- Inspect the base surfaces where new roofing will be applied. NanoTech Materials requires an adhesion test to be performed during the inspection of all roof remediation candidates.
- Do not commence the installation of the NanoTech Materials coating system until its compatibility and adhesion have been confirmed through test patches, all preparatory tasks have been completed, and any unsatisfactory conditions have been addressed.
- Ensure proper water drainage from the roof. The roof should not retain water for over 48 hours following the cessation of precipitation. NanoTech Materials defines “ponding” as water that remains on the roof surface for more than 48 hours after the end of precipitation. Ponding may also occur due to other water sources, such as improperly routed air conditioning condensate and steam condensate lines.
- Shield nearby surfaces that will not receive the coating.
- Refrain from applying liquid-applied roofing products to surfaces deemed unsuitable by NanoTech Materials or under adverse environmental conditions, as defined in individual spec sheets.
- The roof must be clean, dry, and devoid of any debris prior to the application of any liquid-applied products. NanoTech Materials liquid-applied roofing products are not intended for use on substrates subject to heavy foot traffic. In cases where substantial foot traffic is anticipated, utilize a rooftop walkway system approved by NanoTech Materials.

Always contact NanoTech Material's Technical Sales Support Services at (888) 296-6266 for questions. NanoTech must approve exposure to any chemicals or products such as those used to clean mechanical equipment.

Proper Preparation

For the correct application of the coating, it's crucial to thoroughly clean the existing roof. All accumulated dust, chalky residue, exposed bitumen, greases, oils, and any other loose materials must be eliminated before applying the coating. It is imperative to avoid solvent-based cleaners when preparing a roofing substrate for the application of the NanoTech Materials Cool Roof Coat. A pressure washer is the only approved cleaning mechanism.

Should pressure washing fail to fully clean the roof, contact the Nanotech Materials support team prior to applying a cleaning agent, to check for chemical compatibility with the coating. Exercise caution during pressure washing to maintain the integrity of the existing roof covering and to prevent damage, particularly to adhered seam areas. The roof should be completely dry before initiating any priming or coating process.

Depending on the results of the adhesion test, the use of a primer might be necessary. Any essential repairs to the roof or flashings should be carried out and given sufficient time to cure where needed. For more detailed information on roof preparation, consult specific sections of this manual.

Existing Roof Substrate Inspection

The roof surface shall be inspected for blisters, ridges, mole runs, unadhered membranes, or in the case of metal roofing rust and pitted metal. All surface defects must be corrected to industry standards as established by the manufacturer or NRCA Repair Manual. Other sources may be submitted for NanoTech's approval.

Underneath membrane roofing systems, there is usually a layer of insulation. Should the roof have experienced leaks in the past, it's possible that wet insulation may exist within the current roofing structure. Any damp roof insulation must be identified, removed, and replaced before the coating process. While some sections of wet insulation might be detectable simply by feeling the surface as you walk, conducting a moisture survey or core sample analysis is advisable for a more precise identification of these areas.

Metal roofs are typically mounted over a solid roofing deck or above purlins and insulation. Inspecting the lower side of the roof deck can help in spotting regions of wet insulation, a deteriorated deck, or other damages that require attention and repair before proceeding with the coating.

Moisture Survey

The contractor is responsible for ensuring there is no subsurface moisture present and any insulation remains dimensionally sound. A suitable moisture survey method is to be approved by NanoTech and all moisture identified removed. Additionally, an underside inspection is to be conducted to ensure there are no visible defects or structural concerns.

Repair Standards

Challenges identified from the inspections described above will be corrected. The section outlined below provides general corrective

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procedures and are not necessarily comprehensive or complete. The standard of repair will include one or more of the following: manufacturer's published requirements, National Roofing Contractor Association's Repair Manual, or other industry standard submitted and approved in writing by NanoTech.

Metal

Areas of Concern	Treatment
Excessive Gaps	Seal cracks, joints, penetrations, and curbs with NanoTech Roof Sealant and Fabric (3-course) as recommended. See Technical Data Sheet for details and spread rates.
Rust Areas	Replace severely damaged or rusted panel and fasteners. Replace roof panels with holes due to extensive corrosion. Treat light rust areas NanoTech Rust Inhibiting Primer. See Technical Data Sheet for details and coverage rates.
Seams	Treat all seams with NanoTech TriSeam. See Technical Data Sheet for details and coverage rates.
Fasteners	Remove and replace all free-spinning fasteners with oversized with neoprene washers. Fully encapsulate all fasteners with NanoTech Roof Sealant. See Technical Data Sheet for details and spread rates.
Dented / Damaged Panels	Mechanically remove dents as much as possible. Replace severely damaged roof panels.
Open Ridge Vents	Replace or install sheet metal caps over open ridge vents if rust is inside or the roof is in a harsh environment (e.g., saltwater areas). Ensure not to seal weep holes on vents.

Damaged Substrate Treatment: Non-Metal

Areas of Concern	Treatment
Spray Polyurethane Foam	Scarify and re-foam areas where urethane foam has degraded to create a smooth substrate. Remove and re-foam any wet/damaged foam areas.
EPDM	Repair areas where EPDM is torn, cracked, or buckled using compatible materials. Replace any wet insulation. Allow at least 48 hours drying time before applying liquid-applied products.
PVC	Repair areas where PVC is torn, cracked, or buckled using compatible materials. Replace any wet insulation. Allow at least 48 hours drying time before applying liquid-applied products.
Granular Surfaced BUR or Modified Bitumen (SBS & APP) OR Smooth Surfaced BUR or Modified Bitumen (SBS & APP)	Remove and repair blistered, buckled, wet, or damaged asphaltic membranes using compatible materials. New BUR or modified bitumen repair materials must weather for at least 30 days before applying liquid- applied products. Repair significant cracks (gaps 1/16" [1.6 mm] or greater) using NanoTech Roof Sealant. Allow NanoTech Roof Sealant at least 8 hours drying time or dry to touch before application; thicker applications may require more. Gravel-surfaced BUR is not suitable for liquid-applied coating.
TPO	Repair areas where TPO is torn, cracked, or buckled using compatible materials. Replace any wet insulation. Allow at least 48 hours drying time after cleaning before applying liquid-applied products.
General Surface Prep	Clean and prepare surfaces for liquid-applied roofing products. Remove dirt, dust, loose particles, grease, oil, laitance, pollution fallout, and contaminants. Use a stiff bristle push broom and/or pressure washing for cleaning.

Pressure Washing	<p>Pressure-wash substrate with water/approved cleaner as per Cleaner & Primer Guide. Minimum working pressure of 2,000 psi for most substrates; 3,000 psi for concrete, EPDM, and metal.</p> <p>Avoid damaging roof surface or injecting water into substrate.</p> <p>Allow at least 48 hours drying time before applying liquid-applied products.</p>
Environmental Considerations	<p>Corrugated or structural transite panels may contain asbestos, which can be hazardous when pressure-washed. It's the Installer's responsibility to check for proper disposal and worker protection.</p> <p>Use roof wash-off catchment systems where required. Follow state and local requirements for catchments during cleaning.</p>

Substrate Preparation: Metal

Areas of Concern	Treatment
Pre-Finished Metal Panels	<p>For roof panels with fluoropolymers, or silicone, conduct adhesion tests determine the need for priming.</p> <p>Apply primer per specifications if necessary.</p>
Sealer Pockets	Apply NanoTech Materials TriSeam, encapsulating entire pocket.
Ponding Water Areas	<p>Remove existing roof membrane. Install tapered insulation. Install membrane of like material over newly installed tapered insulation, ensuring watertight integrity.</p> <p>Treat unresolvable ponding water areas with NanoTech Materials Sub Slope Silicone prior to applying other coatings.</p>
Gutter Straps	Fully encapsulate all gutter straps fastened above roof panels with NanoTech Materials TriSeam including the fasteners.
Neoprene Pipe Boots	<p>Install neoprene pipe boots before flashing work for certain pipe penetrations.</p> <p>Seal boots to the roof with NanoTech Materials TriSeam before mechanically fastening.</p>
Ridge Caps	<p>Flash all ridge caps with recommended coating and fabric.</p> <p>Fill voids/open areas in ridge cap with polyurethane foam or backer rod before applying coating and fabric. For "Z" closures near ridge cap edge, remove exposed sealant and apply seam coating liberally to all sides where they intersect with both the roof panel and ridge cap.</p>
Crickets	<p>Install sheet metal crickets as per manufacturer's specifications.</p> <p>Seal new crickets with approved sealant under the flanges before mechanically fastening to the curb unit and metal roof panel.</p> <p>Stitch-screw cricket flanges to the curb unit and metal roof panel while the approved sealant is still wet using fasteners.</p>
Condensate Lines	<p>Install condensate lines from HVAC units to gutters as part of the drainage system, adhering to local building codes.</p> <p>Wood blocking wrapped in membrane should be used to support lines.</p>
Residual Asphalt	Remove any existing asphaltic roof coating. Coat any residual asphalt with the recommended coating/primer for the specific system.
Skylights	<p>Treat curb skylights as curb flashings. Seal skylight curbs with NanoTech Cool Roof Coat (12 WFT minimum).</p> <p>For polycarbonate corrugated skylights apply NanoTech Skylight Sealer over total skylight, overlapping onto the newly applied NanoTech Cool Roof Coat by 6".</p>
Penetrations	<p>Apply NanoTech Roof Sealant and fabric around the base of all penetrations, embedding a minimum 12" (305 mm) width fabric between two coating layers, extending 6" (152 mm) up the vertical and 6" (305 mm) onto the base.</p> <p>Cut fabric to fit the shape of the penetration to avoid wrinkles.</p>

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Rakes	<p>Seal all fixed rake details with at least 12" (305 mm) of NanoTech Roof Sealant and fabric, embedding fabric between two coating layers, extending 6" (152 mm) up the vertical and 6" (152 mm) onto the base.</p> <p>If fixed rake metal is fastened atop roof panel ribs, trim excess metal and follow horizontal seam flashing procedures.</p> <p>Fill all voids/open areas with polyurethane foam before applying coating and fabric.</p>
Curb Flashings	Seal curb flashings with NanoTech Cool Roof Coat (12 WFT minimum) to the highest point possible.
Parapet Walls	Apply NanoTech Cool Roof Coat (12 WFT minimum) to the highest point possible.
Cinch Straps at Panel End Laps	<p>Re-tighten cinch straps as needed.</p> <p>Surround each strap and fastener head with a bead of NanoTech Materials Roof Sealant.</p> <p>Inject sealant into the cinch strap water channel, then seal the entire lap, strap, and fastener heads with a minimum 12" (305 mm) width NanoTech Roof Sealant.</p>
Corrugated Seam	Seal all vertical seams of corrugated panels with NanoTech Materials TriSeam. Feather the coating until seams are no longer visible, brushing parallel to the seam.
Horizontal Seam	Apply NanoTech Materials TriSeam.

Substrate Preparation: PVC

Areas of Concern	Treatment
Penetrations	<p>Around all penetration bases, apply NanoTech Materials Roof Sealant and fabric, ensuring a fabric width of at least 12" (305 mm) between two coating layers, extending 6" (152 mm) up the vertical and 6" (305 mm) onto the base.</p> <p>Shape the fabric to fit the contours of the penetration, ensuring it is wrinkle-free.</p>
Skylights	Treat curb skylights as curb flashings. Seal skylight curbs with NanoTech Cool Roof Coat (12 WFT minimum). Apply NanoTech Skylight Sealer to all translucent surfaces.
Condensate Lines	<p>Install condensate lines from HVAC units to gutters as part of the drainage system, adhering to local building codes.</p> <p>Wood blocking wrapped in membrane should be used to support lines.</p>
Sealer Pockets	Apply NanoTech Materials TriSeam, encapsulating entire pocket.
Parapet Walls/Curb Flashings	Apply NanoTech Cool Roof Coat (12 WFT minimum) to the highest point possible.

Damaged Substrate Treatment: Non-Metal

Areas of Concern	Treatment
Wood OSB/Plywood/Tongue & Groove	<p>Remove and repair areas with rotten, wet, or damaged substrate using similar products.</p> <p>Fill gaps greater than 1/4" [6mm] between roof panels/penetrations with NanoTech Materials Roof Sealant.</p> <p>Retighten or replace all necessary fasteners.</p> <p>Replace stripped fasteners with oversized.</p> <p>Replace all deteriorated and missing fasteners.</p> <p>Fully encapsulate fasteners with NanoTech Materials Roof Sealant.</p>
Spray Polyurethane Foam	<p>Scarify and re-foam areas where urethane foam has degraded to create a smooth substrate.</p> <p>Remove and re-foam any wet/damaged foam areas.</p>
EPDM	<p>Repair areas where EPDM is torn, cracked, or buckled using compatible materials. Replace any wet insulation.</p> <p>Allow at least 48 hours drying time before applying liquid-applied products.</p>

PVC	<p>Repair areas where PVC is torn, cracked, or buckled using compatible materials. Replace any wet insulation.</p> <p>Allow at least 48 hours drying time before applying liquid-applied products.</p>
Granule Surfaced BUR or Modified Bitumen (SBS & APP) OR Smooth Surfaced BUR or Modified Bitumen (SBS & APP)	<p>Remove and repair blistered, buckled, wet, or damaged asphaltic membranes using compatible materials.</p> <p>New BUR or modified bitumen repair materials must weather for at least 30 days before applying liquid-applied products.</p> <p>Repair significant cracks (gaps 1/16" [1.6 mm] or greater) using flashing grade coating.</p> <p>Allow NanoTech Materials Roof Sealant at least 8 hours drying time before application; thicker applications may require more.</p> <p>Gravel-surfaced BUR is not suitable for liquid-applied coating.</p>
Corrugated Structural Transite Panels	<p>Fill gaps greater than 1/4" [6 mm] with closed-cell foam strips or polyurethane foam.</p> <p>Retighten or replace all necessary fasteners.</p> <p>Replace stripped fasteners with oversized and neoprene washers.</p> <p>Replace all deteriorated or missing fasteners.</p> <p>Fully encapsulate fasteners with NanoTech Materials Roof Sealant</p> <p>Repair all horizontal seams as needed.</p> <p>Consult the Seam Treatment Guide.</p> <p>Note potential asbestos content.</p> <p>See Environmental Considerations in Cleaning Procedures for more information.</p>
TPO	<p>Repair areas where TPO is torn, cracked, or buckled using compatible materials.</p> <p>Replace any wet insulation. Allow at least 48 hours drying time after cleaning before applying liquid-applied products.</p>

Substrate Preparation: TPO

Areas of Concern	Treatment
Penetrations	<p>Apply NanoTech Materials Roof Sealant and fabric around the base of all roof penetrations, embedding a 12" (305 mm) width of fabric between two layers of the coating, extending 6" (152 mm) vertically and 6" (305 mm) onto the base.</p> <p>Shape the fabric to fit the penetration contour to prevent creasing.</p>
Skylights	<p>Treat curb skylights as curb flashings. Seal skylight curbs with NanoTech Cool Roof Coat (12 WFT minimum). Apply NanoTech Skylight Sealer to all translucent surfaces.</p>
Condensate Lines	<p>Install condensate lines from HVAC units to gutters as part of the drainage system, adhering to local building codes.</p> <p>Wood blocking wrapped in membrane should be used to support lines.</p>
Sealer Pockets	<p>Encapsulate entire sealer pocket with NanoTech Materials TriSeam</p>
Parapet Walls/Curb Flashings	<p>Apply NanoTech Cool Roof Coat (12 WFT minimum) to the highest point possible.</p>

Substrate Preparation: EPDM

Areas of Concern	Treatment
Penetrations	<p>Apply NanoTech Materials Roof Sealant and fabric around the base of all roof penetrations, embedding a 12" (305 mm) width of fabric between two layers of the coating, extending 6" (152 mm) vertically and 6" (305 mm) onto the base.</p> <p>Shape the fabric to fit the penetration contour to prevent creasing.</p>
Skylights	<p>Treat curb skylights as curb flashings. Seal skylight curbs with NanoTech Cool Roof Coat (12 WFT minimum). Apply NanoTech Skylight Sealer to all translucent surfaces.</p>

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Condensate Lines	Install condensate lines from HVAC units to gutters as part of the drainage system, adhering to local building codes. Wood blocking wrapped in membrane should be used to support lines.
Sealer Pockets	Encapsulate entire sealer pocket with NanoTech Materials TriSeam
Parapet Walls/Curb Flashings	Apply NanoTech Cool Roof Coat (12 WFT minimum) to the highest point possible.

Substrate Preparation: Asphaltic (Smooth and Granulated)

Areas of Concern	Treatment
Penetrations	Apply NanoTech Materials Roof Sealant and fabric around the base of all roof penetrations, embedding a 12" (305 mm) width of fabric between two layers of the coating, extending 6" (152 mm) vertically and 6" (305 mm) onto the base. Shape the fabric to fit the penetration contour to prevent creasing.
Skylights	Treat curb skylights as curb flashings. Seal skylight curbs with NanoTech Cool Roof Coat (12 WFT minimum). Apply NanoTech Skylight Sealer to all translucent surfaces.
Condensate Lines	Install condensate lines from HVAC units to gutters as part of the drainage system, adhering to local building codes. Wood blocking wrapped in membrane should be used to support lines.
Sealer Pockets	Encapsulate entire sealer pocket with NanoTech Materials TriSeam
Parapet Walls/Curb Flashings	Apply NanoTech Cool Roof Coat (12 WFT minimum) to the highest point possible.

Substrate Preparation: Structural Concrete

Areas of Concern	Treatment
Penetrations	Apply NanoTech Materials Roof Sealant and fabric around the base of all roof penetrations, embedding a 12" (305 mm) width of fabric between two layers of the coating, extending 6" (152 mm) vertically and 6" (305 mm) onto the base. Shape the fabric to fit the penetration contour to prevent creasing.
Skylights	Treat curb skylights as curb flashings. Seal skylight curbs with NanoTech Cool Roof Coat (12 WFT minimum). Apply NanoTech Skylight Sealer to all translucent surfaces.
Condensate Lines	Install condensate lines from HVAC units to gutters as part of the drainage system, adhering to local building codes. Wood blocking wrapped in membrane should be used to support lines.
Sealer Pockets	Encapsulate entire sealer pocket with NanoTech Materials TriSeam
Parapet Walls/Curb Flashings	Apply NanoTech Cool Roof Coat (12 WFT minimum) to the highest point possible.

Adhesion Testing

Adhesion testing is typically carried out to ascertain the compatibility of a base surface for the application of a liquid-applied coating system. NanoTech Materials requires an adhesion test to be performed on all roofing substrates prior to the application of the coating. The use of NanoTech Primer is required for any substrate which fails an adhesion test. The adhesion test must be repeated once the primer has been applied. If the adhesion test fails a second time, the application is to be rejected.

When conducting adhesion tests:

- The test patches should be clearly marked and photographed to record the outcomes of the adhesion tests.
- For insights regarding the outcomes of adhesion tests, installers can reach out to NanoTech Materials' Technical Sales Support Services

NanoTech Recommends the following test method:

Field Peel Adhesion

Overview: The ASTM D903 "Peel Adhesion" test is a standard procedure in roof coating guidelines, particularly effective for onsite testing with elastomeric materials. This test, along with a similar one, ASTM D3359 "Tape Adhesion," is applicable for evaluating primers and enamels.

Preparation:

- Create a sample section of the intended coating system on the current roof surface. Execute any required mechanical surface preparations.
- Replicate cleaning processes via power washing.
- Coat 6" by 2" of the substrate with a single layer of the NanoTech Materials Cool Roof Coat.
- Set up at least three (3) test patches for the initial 100 squares and an additional patch for each subsequent 100 squares in various areas of the roof to test adhesion for any doubtful roof substrates.

Test Method:

- Insert approximately 6" (152 mm) of a precut 1" (25 mm) x 12" (305 mm) fabric strip into the wet coating. Keep an extra 6" (152 mm) of the fabric strip free for pulling during the test.
- Add another coating layer to cover the moistened section of the fabric.
- Allow sufficient drying time, which can range from 8 hours to 48 hours depending on the weather. Ensure the test patch is not exposed to rain during the cure time.

Evaluation:

- Employ a force gauge, such as a digital fish scale or a trigger pressure gauge.
- Utilize a loop, staple, or clamp to secure the fabric to the gauge.
- Gently pull the fabric straight upwards at a 90-degree angle; the average force should exceed 2 PLI (Pounds per linear inch of fabric width).

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2.0 General Installation

THESE ARE GENERAL INSTALLATION INSTRUCTIONS. REFER TO THE ROOF SUBSTRATE SPECIFICATION FOR MORE DETAILS ON INSTALLATION

Technical Advice

- The application of this coating should be executed with guidance from the manufacturer's technical representative. For assistance, contact NanoTech Materials Technical Services.

Repairs

- Address all leaks and seal flashings on the existing substrate using comparable materials as suggested by the original manufacturer prior to the application of NanoTech Materials Roof Coatings. Areas repaired recently may necessitate an appropriate primer. For primer suggestions, consult the NanoTech Materials ancillary systems list.

Seams, Penetrations and Detail Work

- Use NanoTech Materials Roof Sealant, applying it via brush or roller with a minimum width of 6 in (152 mm) over the seam at a rate of at least ½ gallon per 100 sqft. Immediately place a 4 in (102 mm) strip of Reinforcing Polyester Mesh Tape into the wet coating, ensuring full integration into the coating. The Reinforcing Polyester Mesh Tape should be laid out smoothly, devoid of wrinkles, "fish mouths," blisters, or pinholes.
*As an alternative to conventional 3-course, it is recommended to apply NanoTech Materials TriSeam at a rate of 2 gallons per 100 linear feet.
- Once the initial coating with the embedded fabric is firm to touch, add another layer of NanoTech Materials Roof Coating at a minimum of ½ gallon per 100 sqft for thorough encapsulation of the tape. Allow a drying time of at least 4 – 6 hours (in conditions of 75°F (24°C) and 50% RH) before progressing to the subsequent installation step. Be aware that lower temperatures or higher humidity can prolong drying times. Do not apply NanoTech Materials Roof Coating if rain or heavy dew is anticipated within 8 hours. Aim to apply the product in the morning for optimal drying time during daylight. The product should be walkable in 90 minutes.

Roof Equipment (HVAC / Sleepers)

- Units resting on 4 in x 4 in (101.6 mm x 101.6 mm) wooden sleepers should be raised to allow for cleaning, priming (as necessary per adhesion test results), and coating of the membrane beneath them as per the guidelines in this document. A protective slip sheet should be placed under the sleepers to safeguard the coating system. If units are not elevated from the deck to facilitate this process, the unaddressed area will be exempt from warranty coverage.

Primer

- Should adhesion tests indicate a need for primer, apply NanoTech Materials Primer in accordance with instructions, avoiding any pooling on the surface. The required Minimum coverage rate is 300 sqft per 1 gallon. The primer can be applied using one of the following methods: brush, roller, or sprayer. Be mindful to prevent puddling when spraying. Allow the approved Primer to dry completely. Drying times can vary and are dependent on ambient conditions.

Product Circulation Guidelines

- This is a high-solids, acrylic emulsion formulation that is a non-Newtonian fluid. This means that the product must be thoroughly agitated to lower its viscosity from a solid state to a liquid state. If the product is left standing in the packaging, or in the application machine, or any container after agitation for more than 45 minutes, it must be agitated again to prevent its viscosity from increasing back to a solid state from a liquid state.
- Follow these simple guidelines:
 - Agitate the product using a helicoidal paddle and a mixer with high rpm capability for at least 10 minutes when applying from a 5-gallon bucket.
 - Agitate the product for at least 5 minutes and up to 10 minutes for a product that has been left standing in a bucket for more than 45 minutes. If product is shipped in a drum or tote the product should be agitated utilizing an EvenMix dual paddle tote mixer for a minimum of 45 minutes.
- The life of the product after being opened and resealed is 30 days or less, depending on how well the leftover product has been sealed in a container that does not allow air circulation. Inspect and remove any cured resin or solid bits from a used bucket, if any, before using leftover product and follow agitation guidelines.

Acrylic Coating Base Coat

- Apply NanoTech Materials Cool Roof Coating at an average rate of 2.5 gal/100 ft² to achieve a Wet Film Thickness (WFT) of 28 mils.

The application should not exceed 2.5 gal/100 ft² per coat. NanoTech Materials Roof Coating can be applied with a 3/8 in (10 mm) nap roller, brush, or airless sprayer. Ensure all surfaces are coated, including expansion joint covers and flashings. Apply an extra coat around all edges and penetrations. Adjust drying times as necessary for environmental conditions (see note below).

Second Coat

- Repeat the application of NanoTech Materials Cool Roof Coating at the same rate to achieve the specified WFT of 56 and DFT 40. Follow the same application techniques as the base coat. Allow sufficient drying time, adjusting for environmental factors.
*NOTE- When a 20-year NDL with 2" hail is required, an additional 1.5 gallons per 100 sqft of NanoTech Materials Base Coat (24 WFT / 15 DFT) is required. Base coat is to be applied as the primary coat.

NOTE: MINIMUM DRY TIME PER COAT IS 8 HOURS AT 75°F (24°C) AND 50% RH. Expect longer drying times in cooler temperatures or higher humidity. Avoid applying NanoTech Materials Cool Roof Coat if rain or heavy dew is expected within 8 hours. The product should be walkable in 90 minutes.

NOTE ON AIRLESS:

- Use a 2,000 – 3,000 psi (13.8 MPa – 20.7 MPa) at the gun tip, with a flow rate of 1.6 –3.0 gal/min (3.8 L – 11.4 L/min) and tip sizes ranging from 0.025 – 0.040 in (0.64 – 1 mm). Larger spray units are beneficial for longer hoses on bigger projects. For assistance in selecting the best equipment for specific project needs, contact Technical Services.
- Any deviations from the specified standards identified by the Applicator or the owner's representative must be rectified by the Applicator.

Recommended Equipment for Application (Sprayer)

- Please check Section 13.0 for application equipment.

Recommended Equipment for Application (Roller)

- Paint roller
- Paint brush
- Wet Mil Gage

Cleaning and Usage

- Clean the spraying machine immediately after use to avoid curing of the resin inside the pump and the hose. Follow the manufacturer's standards on cleaning procedures.
- Use and service the spraying machine following the manufacturer's recommendations.

Minimum Dry Film Thickness (DFT) Requirement

- The NanoTech Cool Roof Coat system requires the application of two layers of 28 wet mils, building up to a WFT of 56 mils. The coating will have a 15% - 20% shrink rate, dry curing to a DFT of 40 mils.
- The coated surface should not be subjected to foot traffic for at least three (3) days following application. Any damage caused to the surface by other trades will not be the responsibility of the Applicator.

Additional Product Details

Qualification for Contractors

- The Contractor shall be a certified applicator of Nanotech Materials' Cool Roof coatings product and recommends that the applicator have a minimum of three years of experience applying elastomeric roof coatings. NanoTech applicators are required to follow all OSHA safety standards. Nonetheless, NanoTech, at its sole discretion, reserves the right to decide if a Contractor meets the level of experience necessary to be registered as a certified applicator.

Testing and Labeling

- The NanoTech Cool Roof Coat is produced in NanoTech facilities certified to the ISO9001:2015 quality management standards. Routine in-house and third-party laboratory testing is performed, and full traceability of all product components is maintained. Any questions or concerns related to the product and or its application should be directed to info@nanotechmaterials.com . Please include the LOT # information from the product label.

Product Warranty

- Please check Section 12.1 for the product warranty.

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Product Handling and Storage

For safe handling of this product read the SDS and TDS and follow these guidelines:

- Avoid breathing the material.
- Use only in a well-ventilated area.
- As with all chemicals, good industrial hygiene practices should be followed when handling this material. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling.

For Storing this Product

- Store in a cool (40-100), dry place, and not exposed to the elements. DEGREES APPLIED TO NUMBER AFOREMENTIONED
- Keep container(s) closed when not in use.
- Store locked up.
- Store in a well-ventilated place.
- Keep cool.
- Storage temperature: 40-100°F.
- Keep only in the original container.
- Protect against the elements.

3.0 Metal Roof Systems

This is a generic summary of NanoTech Material's more detailed METAL ROOF SYSTEM SPECIFICATION. For warranty purposes, Approved Applicators are responsible for studying, understanding, and following the specification. As always, contact NanoTech Materials for technical assistance.

SURFACE PREPARATION - CLEANING

1. Remove loose rust and scale with a wire brush.
2. If present, remove as much aluminized asphalt or asphaltic mastic as possible.
3. Pressure wash roof deck with TSP or other suitable cleaner and rinse with water.
4. Passivate rust areas with NanoTech Materials Rust Inhibiting Primer.

SURFACE PREPARATION - PRIMING

1. Tighten all loose fasteners.
2. Sink extra fasteners as necessary to tighten up loose seams or laps.
3. Complete any required or necessary structural repairs.
4. Prime all galvanized or non-painted metal with NanoTech Materials Rust Inhibiting Primer and allow to dry. When estimating materials, assume an application rate of 0.4 gallons per square (200 square feet per gallon).

SURFACE PREPARATION - DETAILING

1. Seal all vertical seams with one-inch-wide line of filling in the narrow gap.
2. Seal all horizontal and ridge cap seams with six-inch-wide line of Nanotech Materials TriSeam filling in all gaps and low spots:
3. Inspect and repair as necessary.
4. Completely encapsulate each fastener head with NanoTech Materials Sealant. (Approximately 800 fasteners per gallon)
5. Alternate Detailing
6. Seal all vertical seams with a one-inch-wide line of NanoTech Materials Sealant, forcing some sealant into the gap.
7. Seal all horizontal and ridge cap seams with the following method:
 - Brush a coat of NanoTech Materials Sealant along either side of seam.
 - Embed 4-inch-wide strip of non-woven polyester fabric in NanoTech Materials Sealant.
 - Brush heavy coat of NanoTech Materials Sealant over polyester, ensuring no wrinkles or fish mouths.
 - Allow to cure overnight. Inspect and repair as necessary.
 - This procedure requires approximately 1 gallon of NanoTech Materials Sealant per 50 linear feet (approximately 6 inches wide).
 - Use this method to bridge any gaps or holes in the roof deck, so as to ensure that the NanoTech Materials Cool Roof Coat membrane will be continuous.
8. Completely encapsulate each fastener head with NanoTech Materials Sealant. (Approximately 800 fasteners per gallon)
9. When estimating materials, assume an application rate of 0.5 gallons of NanoTech Materials Sealant per square.

COATING APPLICATION

1. The surface to be coated must be clean and dry.
2. Apply NanoTech Materials Cool Roof Coat elastomeric roof coating with an airless sprayer, giving special attention to seams and bridged or repaired areas.
3. Use an appropriate number of coats to achieve the correct millage; however, one must use a minimum of two coats.
 - 10-year: 2.5 gallons of NanoTech Materials Cool Roof Coat per square total. One coat application. (20 DFT)
 - 15-year: 2 coats of NanoTech Materials Cool Roof Coat at 2.5 gallons per square total (56 wet mil overall and 40 dry mil overall)
 - 20-year: base coat at 1.5 gallons per square NanoTech Materials Cool Roof Base Coat (24 wet and 15 dry) 2 coats of NanoTech Materials Cool Roof Coat at 2.5 gallons per square (56 wet mil and 40 dry mil) Total dry mil at 55.
4. Allow each coat to dry, inspect and repair as necessary before applying the next coat.

COATING APPLICATION

1. This procedure is to be used only in conjunction with commonly accepted roofing and waterproofing standards.
2. NanoTech Materials Cool Roof Coat, NanoTech Materials TriSeam, NanoTech Materials Roof Sealant and NanoTech Materials Rust Inhibiting Primer shall not be applied during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, when the relative humidity exceeds 85%, or within 4 hours of sundown.
3. In order to qualify for a factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Materials Cool Roof Coat membrane must be continuous, and the membrane must meet the TDM minimum.

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4. In conjunction with the final inspection, remove all debris, material, and equipment from the job site, leaving the area in an undamaged and acceptable condition.

Section 1.0 Scope

The intention of this specification is to outline procedures for the application of a NanoTech Materials Cool Roof Coat elastomeric coating membrane for the purposes of waterproofing, protecting, extending the life, and/or renewing an existing metal roof substrate. This specification describes materials, methods, and conditions necessary for the proper installation of this membrane.

1. This integrated system complies with all model building codes for roofing. Additionally, it constitutes one of the most cost-effective methods of waterproofing, protecting, extending the life, and/or renewing commercial and industrial roofs.
2. This system is to be used only in conjunction with commonly accepted roofing and waterproofing standards.
3. Any substantial deviation from these specifications shall be referred to the authorized representatives of NanoTech Materials.

Section 2.0 Materials

All materials shall be manufactured or approved by NanoTech Materials, and shall meet the following minimum specifications: This specification describes materials, methods, and conditions necessary for the proper installation of this membrane.

1. NanoTech Materials Cool Roof Coat Elastomeric Coating

Vehicle Type	Acrylic
Solids (Volume)	71.8%
Elongation	312%
Permeance @ 45 mils	30.8 perms
Reflectivity (White)	97%

2. NanoTech Materials TriSeam Sprayable Fiber Reinforced Seam Sealer

Vehicle Type	Fiber Reinforced Acrylic
Pigment to Vehicle Ratio	1.5 to 1
Solids (Volume)	63%
Elongation	360%
Tensile Strength	304 psi

3. NanoTech Materials Roof Sealant Brush or Trowel Grade Sealant

Vehicle Type	100% Acrylic
Pigment to Vehicle Ratio	1.97 to 1
Solids (Volume)	70%
Elongation	325%

4. NanoTech Materials Rust Inhibiting Primer Rust Conversion Primer for Metal

Vehicle Type	Proprietary acrylic emulsion
Solids (Weight)	60.3%
Weight (per gallon)	11.90 lbs.
Color	Beige

5. Delivery and Storage

- 5.1. Materials shall be delivered in their original, tightly sealed containers or unopened packages, clearly labeled with the manufacturer's name, Underwriter's Laboratories file number, and—where appropriate—product identification and lot numbers.

- 5.2. Materials shall be kept from freezing, and shall be stored out of the weather, in their original tightly sealed containers or unopened packages, as recommended by the manufacturer.

Section 3.0 Contractor

1. The NanoTech Materials Cool Roof Coat elastomeric coating membrane shall be applied by a single, experienced, and competent contractor or applicator, approved by NanoTech Materials.
2. Contractor or applicator shall be responsible for selecting and supplying all labor and supervision, and shall be responsible for furnishing all materials required to complete the job satisfactorily, in accordance with manufacturer's specifications.
3. Contractor or applicator shall be responsible for assessing and determining the integrity of the existing substrate. All structural repairs (including, but not limited to, the installation or repair of insulation, crickets, scuppers, roof drains, one-way vents, and the like) as well as the elimination of areas of gross ponding water, shall be the exclusive responsibility of the contractor or applicator.
 - 3.1. All installations or repairs shall be completed before application of the NanoTech Materials Cool Roof Coat elastomeric coating membrane commences.
 - 3.2. The industry standard definition of gross ponding water is ½ inch or more of water, standing on a 100 square foot or more area, 24 hours or more after a precipitation. Contractor shall be responsible to address and eliminate all such areas before coating application commences.
 - 3.3. All installations or repairs shall be performed in accordance with commonly accepted roofing and waterproofing standards and practices.
 - 3.4. An authorized representative of NanoTech Materials may be consulted for technical assistance in such matters.

Section 4.0 Surface Preparation – Cleaning

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface.

Preparation shall include, but shall not be limited to, the following:

1. All unnecessary and non-functional equipment, conduit, and debris shall be removed from the roof.
2. All structural repairs or installations shall be completed before coating application commences.
 - 2.1. Crickets, roof drains, insulation, one-way vents, scuppers, roof deck, and the like, shall all be installed or repaired before coating application commences.
 - 2.2. Areas of gross ponding water shall have been addressed and eliminated before coating application commences. Consult section 3.3.2 of this specification for further details.
3. The fasteners on all the panels shall be inspected. Loose fasteners shall be tightened and missing fasteners shall be replaced. NanoTech Materials recommends that extra fasteners be installed wherever there is significant or undesirable movement between two panels.
4. PLEASE NOTE: During coating application procedures, NanoTech Materials Cool Roof Coat elastomeric coating shall be applied a minimum of three (3) inches above the termination of all flashings, repairs, and bridges. That is, coating shall be applied to sections of parapet walls, the bases of air handling equipment, penetrations, and the like. Section 7.0 of this specification should be consulted for details. These surfaces must be adequately prepared in order to ensure adhesion of the NanoTech Materials Cool Roof Coat membrane.
 - 4.1. All masonry surfaces to be coated shall be wire-brushed before pressure washing in order to remove all dust.
 - 4.2. All oxidized metallic surfaces to be coated shall be wire- brushed or otherwise abraded before pressure washing in order to remove as much rust and scale as possible.

Section 5.0 Surface Preparation – Priming

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparations shall include, but shall not be limited to, the following:

PLEASE NOTE: During coating application procedures, NanoTech Materials Cool Roof Coat shall be applied a minimum of three (3) inches above the termination of all flashings, repairs, and bridges. That is, coating shall be applied to sections of parapet walls, the

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bases of air handling equipment, penetrations, and the like. Section 7.0 of this specification should be consulted for details. These surfaces must be adequately prepared in order to ensure adhesion of the NanoTech Materials Cool Roof Coat membrane.

1. All metal flashings, expansion joints, penetrations, and other metallic surfaces that are to be coated shall be prepared according to the following procedure.
2. As much loose rust and scale as possible shall already have been removed by abrasion (wire brush or other suitable instrument) from oxidized areas.
3. Primer application shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, or when the relative humidity exceeds 85%. To provide adequate curing time, primer application shall terminate a minimum of two (2) hours before sundown.
4. Entire surface to be primed with NanoTech Materials Rust Inhibiting Primer rust conversion primer for metal shall be free of dust, dirt, tar, oil, moisture, frost, or any other material that would impair the adhesion of the primer to the substrate surface.
5. Using conventional airless spray equipment, brush, or roller, all galvanized, phosphated, and non-painted metallic surfaces that are to be coated—metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall be primed with NanoTech Materials Rust Inhibiting Primer rust conversion primer for metal, or equal, at a rate of 100 to 200 square feet per gallon.
6. At contractor's option, NanoTech Materials Rust Inhibiting Primer may be applied to the seams first, leaving the panels unprimed until after the procedures outlined in section 6.0 are completed. If this option is chosen, the unprimed panels shall be primed, at the required application rate, and allowed adequate curing time, before coating application commences.
7. Primer shall be allowed to cure for approximately two (2) hours, depending upon temperature and relative humidity, after which an inspection shall be performed. Additional NanoTech Materials Rust Inhibiting Primer shall be applied to any areas where there are voids in the primer coat, in order to make the coat continuous.

Section 6.0 Surface Preparation – Detailing

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparation shall include, but shall not be limited to, the following:

1. Detail work shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, or when relative humidity exceeds 85%. To provide adequate curing time, detail work shall terminate a minimum of four (4) hours before sundown.
2. All galvanized, phosphated, and non-painted metallic surfaces to be coated—including, but not limited to, metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall have already been primed with NanoTech Materials Rust Inhibiting Primer corrosion inhibiting primer, or equal, and allowed adequate curing time, before detail work commences.
3. The entire surface to be coated shall be free of dust, dirt, tar, oils, moisture, frost, or any other material that would impair the adhesion of NanoTech Materials Cool Roof Coat elastomeric coating to the substrate surface.
4. All vertical seams shall be sealed with one-inch line of NanoTech Materials TriSeam, or NanoTech Materials Roof Sealant brush or trowel grade sealant. An approximate one (1) inch wide line of NanoTech Materials Roof Sealant shall be applied to every vertical seam, in such a way so as to force a small amount of the caulk up and into the narrow gap along the vertical seam and so that the gap along the edge of the vertical seam is completely bridged. The application rate for this procedure is approximately 1/3 gallon per 100 lineal feet. When estimating materials needed, plan on using at least 1/10 gallon of NanoTech Materials Roof Sealant per 100 square feet for this procedure.
5. All horizontal and ridge cap seams shall be sealed with a six (6) inch line of NanoTech Materials TriSeam, or non-woven or spun polyester roofing cloth embedded between two (2) coats of NanoTech Materials Roof Sealant. An authorized representative of NanoTech Materials shall be consulted for approval of specific types of non-woven polyester. Horizontal and ridge cap seams shall be sealed according to the following procedure:
 - 5.1. Using a brush or other suitable instrument, a six (6) inch wide coat of NanoTech Materials Roof Sealant brush-grade sealant shall be applied over both sides of the horizontal or ridge cap seam to be sealed.
 - 5.2. A four (4) inch strip of non-woven or spun polyester roofing fabric shall be pressed down into the caulk, thus bridging the horizontal or ridge seam.
 - 5.2.1. It is important to ensure that there are no wrinkles or fish mouths in the polyester, especially along the uppermost edge. NanoTech Materials recommends cutting out a section of the polyester fabric so that the polyester does not cover fastener heads. If this is done, these fastener heads shall be coated with a thick coat of NanoTech Materials Roof Sealant while the polyester is being applied.
 - 5.3. The polyester cloth shall then be completely covered with a second coat of NanoTech Materials Roof Sealant. This second coat shall completely cover the polyester and shall be applied within the same working day as the application of the polyester.
 - 5.4. The application rate for this procedure is approximately four (4) gallons of NanoTech Materials Roof Sealant per 100 lineal feet. When estimating materials needed, plan on using approximately ¼ gallon per 100 square feet.

- 5.5. All holes or gaps on or adjacent to the roof deck should be repaired or bridged according to this method as well. Small holes or gaps may be bridged with NanoTech Materials Roof Sealant alone, without the use of polyester cloth.
6. Using a soft, round brush, or other suitable instrument, each fastener head shall be individually encapsulated with NanoTech Materials Roof Sealant. The application rate for this procedure is approximately 1/8 gallon per 100 square feet.
7. After completing these procedures, the sealed seams and encapsulated fasteners shall be allowed to cure overnight. Before coating application commences, all seams shall be inspected and repaired, as necessary, with NanoTech Materials Roof Sealant or an approved building sealant.
8. NanoTech Materials Cool Roof Coat coating shall be applied over the sealed seams during normal coating application procedures.

Section 7.0 Coating Application

1. Coating application shall not commence during inclement weather, when a precipitation appears imminent, when temperature is below 45°F, or when relative humidity exceeds 85%. To provide adequate curing time, coating application shall terminate at least four (4) hours before sundown.
2. Entire surface to be coated shall be free of dust, dirt, tar, oil, moisture, frost or any other material that would impair the adhesion of NanoTech Materials Cool Roof Coat elastomeric coating to the substrate surface.
3. All metallic, asphaltic, or aluminized surfaces to be coated shall have been prepared in accordance with the procedures specified in sections 4-6.
4. NanoTech Materials Cool Roof Coat elastomeric coating: Base Coat
 - 4.1. The base coat of NanoTech Materials Cool Roof Coat elastomeric coating shall be applied at 1½ gallons per 100 square feet using conventional airless spray equipment.
 - 4.2. Coating shall be applied so as to cover the substrate uniformly. All flashed, bridged or repaired areas (as described in section 6) shall be coated again at this time, and during each subsequent coat.
 - 4.3. Wherever possible, coating shall be applied at least three (3) inches beyond the termination of polyester flashings or bridges, especially along parapet walls, penetrations, air handling equipment, and the like.
 - 4.4. The base coat may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 4.5. NanoTech Materials recommends the use of a darker color, like gray, for the base coat, as it cures much faster than a lighter color, such as white.
 - 4.6. The base coat shall be allowed to cure for at least two (2) hours, depending on temperature and humidity conditions, after which an inspection shall be performed. Any defects in the coating membrane shall be repaired with NanoTech Materials Cool Roof Coat or an approved building sealant.
5. NanoTech Materials Cool Roof Coat elastomeric coating: Subsequent Coats
 - 5.1. NanoTech Materials recommends that NanoTech Materials Cool Roof Coat elastomeric coating be applied in contrasting color coats to improve coverage and spray pattern. Order of application shall be as contractor specifies.
 - 5.2. The surface of the NanoTech Materials Cool Roof Coat base coat, and all subsequent coats, shall be free of all moisture, dirt, and debris before a subsequent coat is applied.
 - 5.3. The second coat of NanoTech Materials Cool Roof Coat elastomeric coating shall be applied as soon as practical, within 24-72 hours of the application of the base coat.
 - 5.4. The second coat, and all subsequent coats, shall be applied at a right angle to the direction in which the previous coat was applied. For example, if the previous coat was applied with a north-south motion, the subsequent coat shall be applied with an east-west motion.
 - 5.5. The second coat, and all subsequent coats, shall be applied by conventional airless spray at the rate specified to achieve the TDM minimum in a reasonable number of coats. Each coat shall completely mask the color of the previous coat.
 - 5.6. The second coat, and all subsequent coats, may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 5.7. Subsequent coats shall be applied by conventional airless spray at the rate required to achieve the TDM minimum. It is essential to realize that the true surface area may be greater than the apparent surface area because of surface texture or profile. In order to achieve the TDM minimum on such a surface, the application rate must be increased appropriately.

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- 5.8. Each coat shall be allowed to cure for at least two (2) hours, depending upon temperature and humidity conditions, and inspected and repaired as necessary, before a subsequent coat is applied.
6. The cured NanoTech Materials Cool Roof Coat elastomeric coating system membrane shall be TDM minimum in all areas and shall be free of all pinholes and defects.
7. Required spread rates for the NanoTech Materials Cool Roof Coat elastomeric coating membrane are as follows:
 - 7.1. 5-year application: 2.0 gallons per 100 square feet of NanoTech Materials Cool Roof Coat total (20 dry mil average, 18 dry mil minimum).
 - 7.2. 10-year application: 3.0 gallons per 100 square feet of NanoTech Materials Cool Roof Coat total (30 dry mil average, 25 dry mil minimum).
 - 7.3. 15-year application: 4.0 gallons per 100 square feet of NanoTech Materials Cool Roof Coat total (40 dry mil average, 35 dry mil minimum).
 - 7.4. 20-year application: 5.0 gallons per 100 square feet of NanoTech Materials Cool Roof Coat total (50 Dry mil average, 45 dry mil minimum).
8. Having completed the procedures specified above, and having achieved the TDM minimum in all areas, the NanoTech Materials Cool Roof Coat elastomeric coating membrane shall be given adequate time to cure.
9. For a minimum of thirty (30) days after the membrane has been applied, contractor shall be responsible to inspect the membrane after every precipitation.
 - 9.1. Contractor shall carefully remove water from small ponding areas (“birdbaths”) with an air blower, without damaging the NanoTech Materials Cool Roof Coat membrane.
 - 9.2. Areas of gross ponding water shall have been addressed and eliminated prior to coating application in accordance with commonly accepted waterproofing and roofing practices
10. NanoTech Materials Skylight Sealer or NanoTech Materials Sub Slope Silicone shall be used on any areas susceptible to ponding water. All surfaces to be coated must be clean, dry and completely free of loose particles, grease, oil and/or any substance that would interfere with proper bond. The NanoTech Materials Skylight Sealer Hardener should be emptied into the NanoTech Materials Skylight Sealer Resin and properly mixed for three (3) minutes, then allowed to sit for ten (10) minutes or a long as necessary for all air to escape. NanoTech Materials Skylight Sealer may be applied over NanoTech Materials Cool Roof Coat Acrylic Roof Coating after it has been thoroughly dry for at least 24 hours.

Section 8.0 Clean-Up

Upon completion of all work covered in this specification, and before the job is inspected, the contractor shall remove all equipment, material, and debris, leaving the area in an undamaged and acceptable condition. In no case shall the job be considered complete before the job site has been properly cleaned.

Section 9.0 Limitations

This system is to be used only in conjunction with commonly accepted waterproofing and roofing standards including but not limited to the following:

1. In order to qualify for a factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Materials Cool Roof Coat membrane must be continuous, and the membrane must meet the TDM minimum.
2. No application of component materials shall commence during inclement weather, when a precipitation appears imminent, when temperature is below 45°F, or when relative humidity exceeds 85%.
3. No material shall be applied to wet, dirty, or frozen surfaces.
4. Coating application shall not commence until all other trades are off of the roof.
5. Coating shall not be applied to areas of gross ponding water prior to coating application.
6. In conjunction with the final inspection, all debris, material and equipment are to be removed, leaving the area in an undamaged and acceptable condition.

4.0 Modified Bitumen Systems

This is a generic summary of NanoTech Material's more detailed MODIFIED BITUMEN SYSTEM SPECIFICATION. For warranty purposes, Approved Applicators are responsible for studying, understanding, and following the specification. As always, contact NanoTech Materials for technical assistance.

SURFACE PREPARATION

1. Make sure membrane has reasonable integrity and is secured to roof deck.
2. Pressure wash surface to be coated using TSP or other suitable cleaner and rinse with water.
3. As an alternate you may power broom or leaf blow.
4. Use brush while pressure washing to remove any aluminized asphalt present.
5. Spot prime any aluminized asphalt that cannot be removed with cutback asphalt.
6. Prime all non-painted or galvanized metal that will be coated (e.g., flashings, counterflashing, air handlers, penetrations, and the like).
7. Bridge all gaps around roof deck, penetrations, flashings, holes, etc. with the following method to make sure that the NanoTech Materials Cool Roof Coat membrane will be continuous:
 - Brush a coat of NanoTech Materials Roof Sealant along either side of gap.
 - Embed a strip of non-woven polyester fabric in NanoTech Materials Roof Sealant.
 - Brush heavy coat of NanoTech Materials Roof Sealant into polyester, making sure that there are no wrinkles or fishmouths
 - Allow to cure overnight. Inspect and repair as necessary

COATING APPLICATION

1. The surface to be coated must be clean and dry.
2. Apply NanoTech Materials Cool Roof Coat elastomeric roof coating with an airless sprayer, giving special attention to seams and bridged or repaired areas.
3. The surface to be coated must be clean and dry.
4. Apply NanoTech Materials Cool Roof Coat with an airless sprayer or roller giving special attention to seams and bridged or repaired areas.
5. Use an appropriate number of coats to achieve the correct millage.
 - 10-year: 2.5 gallons of NanoTech Materials Cool Roof Coat per square total. One coat application. (20 DFT)
 - 15-year: 2 coats of NanoTech Materials Cool Roof Coat at 2.5 gallons per square total (56 wet mil overall and 40 dry mil overall)
 - 20-year: base coat at 1.5 gallons per square NanoTech Materials Cool Roof Base Coat (24 wet and 15 dry) 2 coats of NanoTech Materials Cool Roof Coat at 2.5 gallons per square (56 wet mil and 40 dry mil) Total dry mil at 55.
6. Allow each coat to dry, inspect and repair as necessary before applying the next coat.

LIMITATIONS

The intention of this specification is to outline procedures for the application of NanoTech Materials Cool Roof Coat elastomeric coating membrane for the purposes of waterproofing, protecting, extending the life, and/or renewing an existing modified bitumen substrate. This specification describes materials, methods, and conditions necessary for the proper installation of this membrane.

1. This procedure is to be used only in conjunction with commonly accepted roofing and waterproofing standards.
2. No material shall be applied to wet, dirty, or frozen surfaces, or to areas of gross ponding water.
3. NanoTech Materials Cool Roof Coat shall not be applied during inclement weather, when precipitation appears imminent, when the temperature is below 45°F, when the relative humidity exceeds 85%, or within 4 hours of sundown.
4. In order to qualify for factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Materials Cool Roof Coat membrane must be continuous, and the membrane must meet the TDM minimum.
5. In conjunction with the final inspection, all debris, material, and equipment are to be removed from the job site, leaving the area in an undamaged and acceptable condition.

Section 1.0 Scope

The intention of this specification is to outline procedures for the application of NanoTech Materials Cool Roof Coat elastomeric coating membrane for the purposes of waterproofing, protecting, extending the life, and/or renewing an existing modified bitumen substrate. This specification describes materials, methods, and conditions necessary for the proper installation of this membrane.

1. This integrated system complies with all model building codes for roofing. Additionally, it constitutes one of the most cost-effective methods of waterproofing, protecting, extending the life, and/or renewing commercial and industrial roofs.
2. This system is only to be used in conjunction with commonly accepted roofing and waterproofing standards.
3. Any substantial deviation from these specifications shall be referred to an authorized representative of NanoTech Materials.

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Section 2.0 Materials

All materials shall be manufactured or approved by NanoTech Materials, and shall meet the following minimum specifications:

1. NanoTech Materials Cool Roof Coat Elastomeric Coating

Vehicle Type	Acrylic
Solids (Volume)	71.8%
Elongation	312%
Permeance @ 45 mils	30.8 perms
Reflectivity (White)	97%

2. NanoTech Materials Roof Sealant Brush or Trowel Grade Sealant

Vehicle Type	100% Acrylic
Pigment to Vehicle Ratio	1.97 to 1
Solids (Volume)	70%
Elongation	325%

3. NanoTech Materials Rust Inhibiting Primer Rust Conversion Primer for Metal

Vehicle Type	Proprietary acrylic emulsion
Solids (Weight)	60.3%
Weight (per gallon)	11.90 lbs.
Color	Beige

4. Delivery and Storage

- 4.1. Materials shall be delivered in their original, tightly sealed containers or unopened packages, clearly labeled with the manufacturer's name, Underwriter's Laboratories file number, and—where appropriate—product identification and lot numbers.
- 4.2. Materials shall be kept from freezing, and shall be stored out of the weather, in their original tightly sealed containers or unopened packages, as recommended by the manufacturer.

Section 3.0 Contractor

1. The NanoTech Materials Cool Roof Coat elastomeric coating membrane shall be applied by a single, experienced, and competent contractor or applicator, approved by NanoTech Materials.
2. Contractor or applicator shall be responsible for selecting and supplying all labor and supervision, and shall be responsible for furnishing all materials required to complete the job satisfactorily, in accordance with manufacturer's specifications.
3. Contractor or applicator shall be responsible for assessing and determining the integrity of the existing substrate. All structural repairs (including, but not limited to, the installation or repair of insulation, crickets, scuppers, roof drains, one-way vents, and the like) as well as the elimination of areas of gross ponding water, shall be the exclusive responsibility of the contractor or applicator.
 - 3.1. All installations or repairs shall be completed before application of the NanoTech Materials Cool Roof Coat elastomeric coating membrane commences.
 - 3.2. The industry standard definition of gross ponding water is ½ inch or more of water, standing on a 100 square foot or more area, 24 hours or more after a precipitation. Contractor shall be responsible to address and eliminate all such areas before coating application commences.
 - 3.3. All installations or repairs shall be performed in accordance with commonly accepted roofing and waterproofing standards and practices.
 - 3.4. An authorized representative of NanoTech Materials may be consulted for technical assistance in such matters.

Section 4.0 Surface Preparation – Cleaning

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface.

Preparation shall include, but shall not be limited to, the following:

1. All unnecessary and non-functional equipment, conduit, and debris shall be removed from the roof.
2. All structural repairs or installations shall be completed before coating application commences.
 - 2.1. Crickets, roof drains, insulation, one-way vents, scuppers, roof deck, and the like, shall all be installed or repaired before coating application commences.
 - 2.2. Areas of gross ponding water shall have been addressed and eliminated before coating application commences. Consult section 3.3.2 of this specification for further details.
3. The fasteners on all the panels shall be inspected. Loose fasteners shall be tightened and missing fasteners shall be replaced. 3. Contractor shall ensure that the modified bitumen membrane, whether fully adhered or torched down, is adequately secured to the roof deck and still retains reasonable integrity before commencing with coating application. An authorized representative of NanoTech Materials may be consulted for technical assistance in such matters.
4. PLEASE NOTE: During coating application procedures, NanoTech Materials Cool Roof Coat shall be applied a minimum of three (3) inches above the termination of all flashings, repairs, and bridges. That is, coating shall be applied to sections of parapet walls, the bases of air handling equipment, penetrations, and the like. Section 7.0 of this specification should be consulted for details. These surfaces must be adequately prepared in order to ensure adhesion of the NanoTech Materials Cool Roof Coat membrane.
 - 4.1. All masonry surfaces to be coated shall be wire-brushed before pressure washing in order to remove all dust.
 - 4.2. All oxidized metallic surfaces to be coated shall be wire-brushed or otherwise abraded before pressure washing in order to remove as much rust and scale as possible.
5. The entire surface to be coated—including, but not limited to, sections of parapet walls, penetrations, air handling equipment, and the like—shall be pressure washed in order to remove all loose granules, dust, dirt, debris, chalk, oil, tar, and the like from the substrate surface. A suitable cleaner, such as TSP, and a broom shall be used as necessary. If a cleaner is required, the surface shall be rinsed with water to remove residue.
6. Special care shall be taken with surfaces coated with aluminized asphalt. All poorly adhered leafed aluminum shall be removed by vigorous brushing in addition to pressure washing.
7. The anti-blocking agent present on newly installed non-granulated modified bitumen shall be removed according to manufacturer's specifications. If manufacturer specifies that the agent requires weathering for a certain period of time before coating, contractor shall follow these instructions.

Section 5.0 Surface Preparation – Priming

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparations shall include, but shall not be limited to, the following:

PLEASE NOTE: All metal flashings, expansion joints, penetrations, and other metallic surfaces that are to be coated shall be prepared according to the following procedure:

1. As much loose rust and scale as possible shall already have been removed by abrasion (wire brush or other suitable instrument) from oxidized areas.
2. Primer application shall not commence during inclement weather, when precipitation appears imminent, when the temperature is below 45°F, or when the relative humidity exceeds 85%. To provide adequate curing time, primer application shall terminate a minimum of two (2) hours before sundown.
3. Entire surface to be primed with NanoTech Materials Rust Inhibiting Primer for metal shall be free of dust, dirt, tar, oil, moisture, frost, or any other material that would impair the adhesion of the primer to the substrate surface.
4. Using conventional airless spray equipment, brush, or roller, all galvanized, phosphated, and non-painted metallic surfaces that are to be coated—metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall be primed with NanoTech Materials Rust Inhibiting Primer for metal, or equal, at a rate of 100 to 200 square feet per gallon.
5. At contractor's option, NanoTech Materials Rust Inhibiting Primer may be applied to the seams first, leaving the panels unprimed until after the procedures outlined in section 6.0 are completed. If this option is chosen, the unprimed panels shall be primed, at the required application rate, and allowed adequate curing time, before coating application commences.
6. Primer shall be allowed to cure for approximately two (2) hours, depending upon temperature and relative humidity, after which an inspection shall be performed. Additional NanoTech Materials Rust Inhibiting Primer shall be applied to any areas where there are voids in the primer coat, in order to make the coat continuous.

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Aluminized Surfaces:

1. If aluminized asphalt cannot be completely removed by pressure washing and vigorous scrubbing, the area coated with aluminized asphalt shall be primed with a cutback asphalt or an asphalt primer, according to the following procedure:
 - 1.1. Primer application shall not commence during inclement weather, when a precipitation appears imminent, or when the temperature is below 45°F.
 - 1.2. All surfaces to be primed with cutback asphalt or asphalt primer shall be free of dust, dirt, debris, degraded asphalt, moisture, or any other material that would impair the adhesion of the cutback asphalt or asphalt primer to the substrate surface.
 - 1.3. Using conventional airless spray equipment, brushes, mops, or other suitable equipment, the entire aluminized asphalt surface shall be primed with cutback asphalt or asphalt primer at an approximate rate of 300 to 400 square feet per gallon.
 - 1.4. Primer shall be allowed to cure for at least 24 hours. Primer must be dry before coating application commences.
2. In order to minimize color bleed-through into the top coat, the following procedure should be followed (bleed-through will only affect the appearance, and not the integrity, the performance, nor any other physical property of NanoTech Materials Cool Roof Coat):
 - 2.1. If the entire surface to be coated has been primed, all surface preparation procedures shall be completed before starting this procedure. However, if only part of the entire surface to be coated has been primed, it may be desirable to complete this procedure before completing the rest of the surface preparations to allow additional time for curing.
 - 2.2. Using conventional airless spray equipment or rollers, apply a base coat of NanoTech Materials Cool Roof Coat to the surfaces primed with cutback asphalt at an approximate application rate of 1 gallon per 100 square feet. NanoTech Materials recommends that a darker color, like gray, be used for this procedure, since this accelerates the curing process.
 - 2.3. It is possible that bleed-through will occur in this base coat, producing discoloration ("coffee stains"). Allowing the base coat sufficient extra curing time tends to lock the bleed into the base coat, preventing the bleed-through from continuing into the topcoats.

Section 6.0 Surface Preparation – Detailing

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparation shall include, but shall not be limited to, the following:

1. All structural repairs (including, but not limited to, the installation or repair of insulation, crickets, scuppers, roof drains, one-way vents, and the like) shall have been completed prior to detail work commencement. Areas of gross ponding water shall have been addressed and eliminated prior to detail work commencement.
2. Detail work shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, or when relative humidity exceeds 85%. To provide adequate curing time, detail work shall terminate a minimum of four (4) hours before sundown.
3. All asphaltic surfaces to be coated shall have already been primed, if necessary, with cutback asphalt or asphalt primer and shall have been allowed adequate curing time before detail work commences. Refer to section 5.0 of this specification for further details.
4. All galvanized, phosphated, and non-painted metallic surfaces to be coated—including, but not limited to, metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall have already been primed with NanoTech Materials Rust Inhibiting Primer, or equal, and shall have been allowed adequate curing time before detail work commences.
5. The entire surface to be coated shall be free of dust, dirt, tar, oil, moisture, frost, or any other material that would impair the adhesion of NanoTech Materials Cool Roof Coat or NanoTech Materials Roof Sealant to the substrate surface.
6. All penetrations, expansion joints, transitions, gaps on or adjacent to the roof deck, small holes, and the like, shall be flashed, bridged, or repaired according to the following procedure:
 - 6.1. Narrow gaps, small holes and well maintained seams may be sealed with NanoTech Materials Roof Sealant alone, without the use of polyester fabric.
 - 6.2. To bridge wider gaps, fish mouths, tears and visible openings, NanoTech Materials Roof Sealant shall be used in conjunction with non-woven polyester roof fabric.
 - 6.2.1. On a clean, dry surface, a light coat of NanoTech Materials Roof Sealant shall be applied to both sides of the area to be flashed, bridge, or repaired.
 - 6.2.2. A strip of non-woven or spun polyester roofing cloth, of an appropriate width, shall be pressed down into the caulk, thus bridging the gap. It is important to ensure that there are no fishmouths or wrinkles in the polyester.

- 6.2.3. The polyester cloth shall then be completely covered with a second coat of NanoTech Materials Roof Sealant. This second coat shall completely cover the polyester cloth and shall be applied within the same working day as the application of the polyester cloth.
- 6.3. As an alternate to the above three coarse you may use NanoTech Materials TriSeam.
7. After completing this procedure, the newly flashed or bridged areas shall be allowed to cure overnight. Before coating application commences, all such areas shall be inspected and repaired, as necessary, with NanoTech Materials Roof Sealant or NanoTech Materials TriSeam.
8. NanoTech Materials Cool Roof Coat shall be applied over these areas during normal coating operation procedures.

Section 7.0 Coating Application

1. Coating application shall not commence during inclement weather, when a precipitation appears imminent, when temperature is below 45°F, or when relative humidity exceeds 85%. To provide adequate curing time, coating application shall terminate at least four (4) hours before sundown.
2. Entire surface to be coated shall be free of dust, dirt, tar, oil, moisture, frost or any other material that would impair the adhesion of NanoTech Materials Cool Roof Coat elastomeric coating to the substrate surface.
3. All metallic, asphaltic, or aluminized surfaces to be coated shall have been prepared in accordance with the procedures specified in sections 4.0-6.0 of this specification.
4. NanoTech Materials Cool Roof Coat elastomeric coating: Base Coat
 - 4.1. The base coat of NanoTech Materials Cool Roof Coat shall be applied at 1½ gallons per 100 square feet using conventional airless spray equipment or rollers.
 - 4.2. Coating shall be applied so as to cover the substrate uniformly. All flashed, bridged, or repaired areas (as described in section 6.0) shall be coated again at this time, and during each subsequent coat.
 - 4.3. Wherever possible, coating shall be applied at least three (3) inches beyond the termination of polyester flashings or bridges, especially along parapet walls, penetrations, air handling equipment, and the like.
 - 4.4. The base coat may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 4.5. NanoTech Materials recommends the use of a darker color, like gray, for the base coat, as it cures much faster than a lighter color, such as white.
 - 4.6. If sprayed, the base coat (the first pass of the base coat if applied in multiple passes) shall be back rolled as it is being applied in order to maximize adhesion to the substrate and to eliminate voids.
 - 4.7. The base coat shall be allowed to cure for at least two (2) hours, depending on temperature and humidity conditions, after which an inspection shall be performed. Any defects in the coating membrane shall be repaired with NanoTech Materials Cool Roof Coat or an approved building sealant.
5. NanoTech Materials Cool Roof Coat elastomeric coating: Subsequent Coats
 - 5.1. NanoTech Materials recommends that NanoTech Materials Cool Roof Coat be applied in contrasting color coats to improve coverage and spray pattern. Order of application shall be as contractor specifies.
 - 5.2. The surface of the NanoTech Materials Cool Roof Base Coat, and all subsequent coats, shall be free of all moisture, dirt, and debris before a subsequent coat is applied.
 - 5.3. The second coat of NanoTech Materials Cool Roof Coat shall be applied as soon as practical, within 24-72 hours of the application of the base coat.
 - 5.4. The second coat, and all subsequent coats, shall be applied at a right angle to the direction in which the previous coat was applied. For example, if the previous coat was applied with a north-south motion, the subsequent coat shall be applied with an east-west motion.
 - 5.5. The second coat, and all subsequent coats, shall be applied by conventional airless spray or roller at the rate specified to achieve the TDM minimum in a reasonable number of coats. Each coat shall completely mask the color of the previous coat.
 - 5.6. The second coat, and all subsequent coats, may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.

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- 5.7. Subsequent coats shall be applied by conventional airless spray or roller at the rate required to achieve the TDM minimum. It is essential to realize that the true surface area may be greater than the apparent surface area because of surface texture or profile. In order to achieve the TDM minimum on such a surface, the application rate must be increased appropriately.
- 5.8. Each coat shall be allowed to cure for at least four (4) hours, depending upon temperature and humidity conditions, and inspected and repaired as necessary, before a subsequent coat is applied.
6. The cured NanoTech Materials Cool Roof Coat elastomeric coating system membrane shall be TDM minimum in all areas and shall be free of all pinholes and defects.
7. Having completed the procedures specified above, and having achieved the TDM minimum in all areas, the NanoTech Materials Cool Roof Coat membrane shall be given adequate time to cure.
 - 7.1. Contractor shall carefully remove water from small ponding areas (“birdbaths”) with an air blower, without damaging the NanoTech Materials Cool Roof Coat membrane.
 - 7.2. Areas of gross ponding water shall have been addressed and eliminated prior to coating application, in accordance with commonly accepted waterproofing and roofing practices.

Section 8.0 Clean-Up

Upon completion of all work covered in this specification, and before the job is inspected, the contractor shall remove all equipment, material, and debris, leaving the area in an undamaged and acceptable condition. In no case shall the job be considered complete before the job site has been properly cleaned.

Section 9.0 Limitations

This system is to be used only in conjunction with commonly accepted waterproofing and roofing standards including but not limited to the following:

1. In order to qualify for a factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Materials Cool Roof Coat membrane must be continuous, and the membrane must meet the TDM minimum.
2. No application of component materials shall commence during inclement weather, when a precipitation appears imminent, when temperature is below 45°F, or when relative humidity exceeds 85%.
3. No material shall be applied to wet, dirty, or frozen surfaces.
4. Coating application shall not commence until all other trades are off of the roof.
5. Coating shall not be applied to areas of gross ponding water. Contractor shall address and eliminate areas of gross ponding water prior to coating application.
6. In conjunction with the final inspection, all debris, material, and equipment are to be removed, leaving the area in an undamaged and acceptable condition.

5.0 PVC Single-Ply Systems

This is a generic summary of NanoTech Material's more detailed PVC SINGLE-PLY SYSTEM SPECIFICATION. For warranty purposes, Approved Applicators are responsible for studying, understanding, and following the specification. As always, contact NanoTech Materials for technical assistance.

SURFACE PREPARATION

1. Make sure membrane has reasonable integrity and is secured to roof deck.
2. Pressure wash surface to be coated using TSP or other suitable cleaner and rinse with water.
3. Prime all non-painted or galvanized metal that will be coated (e.g., flashings, counter-flashing, air handlers, penetrations, and the like).
4. Bridge all gaps around roof deck, penetrations, flashings, holes, etc. with the following method to make sure that the NanoTech Materials Cool Roof Coat membrane will be continuous:
 - Brush a coat of NanoTech Materials Roof Sealant over both sides of gap.
 - Embed a strip of non-woven polyester fabric in NanoTech Materials Roof Sealant.
 - Brush a heavy coat of NanoTech Materials Roof Sealant over polyester, making sure that there are no wrinkles or fishmouths.
 - Allow to cure overnight. Inspect and repair as necessary.
 - As an alternate, apply NanoTech Materials TriSeam covering 4" above and below gap.

COATING APPLICATION

1. The surface to be coated must be clean and dry.
2. Apply NanoTech Materials Cool Roof Coat elastomeric roof coating with an airless sprayer or roller giving special attention to seams and bridged or repaired areas.
3. Use an appropriate number of coats to achieve the correct millage.
 - 10-year: 2.5 gallons of NanoTech Materials Cool Roof Coat per square total. One coat application. (20 DFT)
 - 15-year: 2 coats of NanoTech Cool Roof Coat at 2.5 gallons per square total (56 wet mil overall and 40 dry mil overall)
 - 20-year: base coat at 1.5 gallons per square NanoTech Materials Cool Roof Base Coat (24 wet and 15 dry) 2 coats of NanoTech Cool Roof Coat at 2.5 gallons per square (56 wet mil and 40 dry mil) Total dry mil at 55.
4. Allow each coat to dry, inspect and repair as necessary before applying the next coat.

LIMITATIONS

1. This procedure is to be used only in conjunction with commonly accepted roofing and waterproofing standards.
2. No material shall be applied to wet, dirty, or frozen surfaces, or to areas of gross ponding water.
3. NanoTech Materials shall not be applied during inclement weather, when precipitation appears imminent, when the temperature is below 45°F, when the relative humidity exceeds 85%, or within 4 hours of sundown. This does not apply to NanoTech Materials Rain Safe Leak Repair.
4. In order to qualify for factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Materials Cool Roof Coat membrane must be continuous, and the membrane must meet the TDM minimum.
5. In conjunction with the final inspection, all debris, material, and equipment are to be removed from the job site, leaving the area in an undamaged and acceptable condition.

Section 1.0 Scope

The intention of this specification is to outline procedures for the application of NanoTech Materials Cool Roof Coat elastomeric coating membrane for the purposes of waterproofing, protecting, extending the life, and/or renewing an existing PVC (polyvinyl chloride or "vinyl") single-ply substrate. This specification describes materials, methods, and conditions necessary for the proper installation of this membrane.

1. This integrated system complies with all model building codes for roofing. Additionally, it constitutes one of the most cost-effective methods of waterproofing, protecting, extending the life, and/or renewing commercial and industrial roofs.
2. This system is only to be used in conjunction with commonly accepted roofing and waterproofing standards.
3. Any substantial deviation from these specifications shall be referred to an authorized representative of NanoTech Materials.

Section 2.0 Materials

All materials shall be manufactured or approved by NanoTech Materials, and shall meet the following minimum specifications:

1. **NanoTech Materials Cool Roof Coat Elastomeric Coating**

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Vehicle Type	Acrylic
Solids (Volume)	71.8%
Elongation	312%
Permeance @ 45 mils	30.8 perms
Reflectivity (White)	97%

2. NanoTech Materials Roof Sealant Brush or Trowel Grade Sealant

Vehicle Type	100% Acrylic
Pigment to Vehicle Ratio	1.97 to 1
Solids (Volume)	70%
Elongation	325%

3. NanoTech Materials Rust Inhibiting Primer Rust Conversion Primer for Metal

Vehicle Type	Proprietary acrylic emulsion
Solids (Weight)	60.3%
Weight (per gallon)	11.90 lbs.
Color	Beige

4. Delivery and Storage

- 4.1. Materials shall be delivered in their original, tightly sealed containers or unopened packages, clearly labeled with the manufacturer's name, Underwriter's Laboratories file number, and—where appropriate—product identification and lot numbers.
- 4.2. Materials shall be kept from freezing, and shall be stored out of the weather, in their original tightly sealed containers or unopened packages, as recommended by the manufacturer.

Section 3.0 Contractor

1. The NanoTech Materials Cool Roof Coat elastomeric coating membrane shall be applied by a single, experienced, and competent contractor or applicator, approved by NanoTech Materials.
2. Contractor or applicator shall be responsible for selecting and supplying all labor and supervision, and shall be responsible for furnishing all materials required to complete the job satisfactorily, in accordance with manufacturer's specifications.
3. Contractor or applicator shall be responsible for assessing and determining the integrity of the existing substrate. All structural repairs (including, but not limited to, the installation or repair of insulation, crickets, scuppers, roof drains, one-way vents, and the like) as well as the elimination of areas of gross ponding water, shall be the exclusive responsibility of the contractor or applicator.
 - 3.1. All installations or repairs shall be completed before application of the NanoTech Materials Cool Roof Coat elastomeric coating membrane commences.
 - 3.2. The industry standard definition of gross ponding water is ½ inch or more of water, standing on a 100 square foot or more area, 24 hours or more after a precipitation. Contractor shall be responsible to address and eliminate all such areas before coating application commences.
 - 3.3. All installations or repairs shall be performed in accordance with commonly accepted roofing and waterproofing standards and practices.
 - 3.4. An authorized representative of NanoTech Materials may be consulted for technical assistance in such matters.

Section 4.0 Surface Preparation – Cleaning

1. Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparation shall include, but shall not be limited to, the following:

2. All unnecessary and non-functional equipment, conduit, and debris shall be removed from the roof.
 - 2.1. All structural repairs or installations shall be completed before coating application commences.
 - 2.2. Crickets, roof drains, insulation, one-way vents, scuppers, roof deck, and the like, shall all be installed or repaired before coating application commences.
3. Areas of gross ponding water shall have been addressed and eliminated before coating application commences. Consult section 3.3.2 of this specification for further details.
4. Contractor shall ensure that the PVC membrane, whether fully adhered or mechanically fastened, is adequately secured to the roof deck before commencing with coating application. An authorized representative of NanoTech Materials may be consulted for technical assistance in such matters.
5. PLEASE NOTE: During coating application procedures, NanoTech Materials Cool Roof Coat shall be applied a minimum of three (3) inches above the termination of all flashings, repairs, and bridges. That is, coating shall be applied to sections of parapet walls, the bases of air handling equipment, penetrations, and the like. Section 7.0 of this specification should be consulted for details. These surfaces must be adequately prepared in order to ensure adhesion of the NanoTech Materials Cool Roof Coat membrane.
 - 5.1. All masonry surfaces to be coated shall be wire-brushed before pressure washing in order to remove all dust.
 - 5.2. All oxidized metallic surfaces to be coated shall be wire-brushed or otherwise abraded before pressure washing in order to remove as much rust and scale as possible.
6. The entire surface to be coated—including, but not limited to, sections of parapet walls, penetrations, air handling equipment, and the like—shall be pressure washed in order to remove all dust, dirt, debris, chalk, oil, tar, and the like from the substrate surface. A suitable cleaner, such as TSP, and a broom shall be used as necessary. If a cleaner is required, the surface shall be rinsed with water to remove residue.
7. Special care shall be taken with surfaces coated with aluminized asphalt. All poorly adhered leafed aluminum shall be removed by vigorous brushing in addition to pressure washing.

Section 5.0 Surface Preparation – Priming

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparations shall include, but shall not be limited to, the following:

PLEASE NOTE: During coating application procedures, NanoTech Materials Cool Roof Coat shall be applied a minimum of three (3) inches above the termination of all flashings, repairs, and bridges. That is, coating shall be applied to sections of parapet walls, the bases of air handling equipment, penetrations, and the like. Section 7.0 of this specification should be consulted for details. These surfaces must be adequately prepared in order to ensure adhesion of the NanoTech Materials Cool Roof Coat membrane.

Metallic Surfaces:

1. All metal flashings, expansion joints, penetrations, and other metallic surfaces that are to be coated shall be prepared according to the following procedure.
2. As much loose rust and scale as possible shall already have been removed by abrasion (wire brush or other suitable instrument) from oxidized areas.
3. Primer application shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, or when the relative humidity exceeds 85%. To provide adequate curing time, primer application shall terminate a minimum of two (2) hours before sundown.
4. Entire surface to be primed with NanoTech Materials Rust Inhibiting Primer rust conversion primer for metal shall be free of dust, dirt, tar, oil, moisture, frost, or any other material that would impair the adhesion of the primer to the substrate surface.
5. Using conventional airless spray equipment, brush, or roller, all galvanized, phosphated, and non-painted metallic surfaces that are to be coated—metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall be primed with NanoTech Materials Rust Inhibiting Primer rust conversion primer for metal, or equal, at a rate of 100 to 200 square feet per gallon.
6. At contractor's option, NanoTech Materials Rust Inhibiting Primer be applied to the seams first, leaving the panels unprimed until after the procedures outlined in section 6.0 are completed. If this option is chosen, the unprimed panels shall be primed, at the required application rate, and allowed adequate curing time, before coating application commences.
7. Primer shall be allowed to cure for approximately two (2) hours, depending upon temperature and relative humidity, after which an inspection shall be performed. Additional NanoTech Materials Rust Inhibiting Primer be applied to any areas where there are voids in the primer coat, in order to make the coat continuous.

Aluminized Surfaces:

1. If aluminized asphalt cannot be completely removed by pressure washing and vigorous scrubbing, the area coated with aluminized asphalt shall be primed with a cutback asphalt or an asphalt primer, according to the following procedure:

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- 1.1. Primer application shall not commence during inclement weather, when a precipitation appears imminent, or when the temperature is below 45°F.
 - 1.2. All surfaces to be primed with cutback asphalt or asphalt primer shall be free of dust, dirt, debris, degraded asphalt, moisture, or any other material that would impair the adhesion of the cutback asphalt or asphalt primer to the substrate surface.
 - 1.3. Using conventional airless spray equipment, brushes, mops, or other suitable equipment, the entire aluminized asphalt surface shall be primed with cutback asphalt or asphalt primer at an approximate rate of 300 to 400 square feet per gallon.
 - 1.4. Primer shall be allowed to cure for at least 24 hours. Primer must be dry before coating application commences.
2. In order to minimize color bleed-through into the top coat, the following procedure should be followed (bleed-through will only affect the appearance, and not the integrity, the performance, nor any other physical property of the NanoTech Materials Cool Roof Coating membrane):
- 2.1. If the entire surface to be coated has been primed, all surface preparation procedures (sections 4.0-6.0) shall be completed before starting this procedure. However, if only part of the entire surface to be coated has been primed, it may be desirable to complete this procedure before completing the rest of the surface preparations to allow additional time for curing.
 - 2.2. Using conventional airless spray equipment or rollers, apply a base coat of NanoTech Materials Cool Roof Coat to the surfaces primed with cutback asphalt at an approximate application rate of 1.5 gallon per 100 square feet. NanoTech Materials recommends that a darker color, like gray, be used for this procedure, since this accelerates the curing process.
 - 2.3. It is possible that bleed-through will occur in this base coat, producing discoloration (“coffee stains”). Allowing the base coat sufficient extra curing time tends to lock the bleed into the base coat, preventing the bleed-through from continuing into the topcoats.
 - 2.4. The base coat should be allowed to cure for at least ten (10) days, longer, if possible, before a subsequent coat is applied.

Section 6.0 Surface Preparation – Detailing

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparation shall include, but shall not be limited to, the following:

1. All structural repairs (including, but not limited to, the installation or repair of insulation, crickets, scuppers, roof drains, one-way vents, and the like) shall have been completed prior to detail work commencement. Areas of gross ponding water shall have been addressed and eliminated prior to detail work commencement.
2. Detail work shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, or when relative humidity exceeds 85%. To provide adequate curing time, detail work shall terminate a minimum of four (4) hours before sundown.
3. All asphaltic surfaces to be coated shall have already been primed, if necessary, with cutback asphalt or asphalt primer and shall have been allowed adequate curing time before detail work commences. Refer to section 5.0 of this specification for further details.
4. All galvanized, phosphated, and non-painted metallic surfaces to be coated—including, but not limited to, metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall have already been primed with NanoTech Materials Rust Inhibiting Primer, or equal, and shall have been allowed adequate curing time before detail work commences. Refer to section 5.0 of this specification for further details.
5. The entire surface to be coated shall be free of dust, dirt, tar, oil, moisture, frost, or any other material that would impair the adhesion of NanoTech Materials Cool Roof Coat or NanoTech Materials Roof Sealant to the substrate surface.
6. All penetrations, expansion joints, transitions, gaps on or adjacent to the roof deck, small holes, and the like, shall be flashed, bridged, or repaired according to one or the other following procedures
7. On a clean, dry surface, a light coat of NanoTech Materials Roof Sealant shall be applied to both sides of the area to be flashed, bridged, or repaired.
8. A strip of non-woven or spun polyester roofing cloth, of an appropriate width, shall be pressed down into the caulk, thus bridging the gap. It is important to ensure that there are no fishmouths or wrinkles in the polyester.
9. The polyester cloth shall then be completely covered with a second coat of NanoTech Materials Roof Sealant. This second coat shall completely cover the polyester cloth and shall be applied within the same working day as the application of the polyester cloth.
10. Narrow gaps and small holes may be sealed with NanoTech Materials Roof Sealant alone, without the use of polyester cloth.
11. After completing this procedure, the newly flashed or bridged areas shall be allowed to cure overnight. Before coating application commences, all such areas shall be inspected and repaired, as necessary, with NanoTech Materials Roof Sealant or an approved building sealant.
12. NanoTech Materials Cool Roof Coat shall be applied over these areas during normal coating operation procedures.

Section 7.0 Coating Application

1. Coating application shall not commence during inclement weather, when a precipitation appears imminent, when temperature is below 45°F, or when relative humidity exceeds 85%. To provide adequate curing time, coating application shall terminate at least four (4) hours before sundown.
2. Entire surface to be coated shall be free of dust, dirt, tar, oil, moisture, frost or any other material that would impair the adhesion of NanoTech Materials Cool Roof Coat elastomeric coating to the substrate surface.
3. All metallic, asphaltic, or aluminized surfaces to be coated shall have been prepared in accordance with the procedures specified in sections 4.0-6.0 of this specification.
4. NanoTech Materials Cool Roof Base Coat
 - 4.1. The base coat of NanoTech Materials Cool Roof Coat shall be applied at 1.5 gallons per 100 square feet using conventional airless spray equipment or rollers.
 - 4.2. Subsequent coats for a 20-year system shall be applied at the same rate of 1.5 gallons per 100 square feet.
 - 4.3. Coating shall be applied to cover the substrate uniformly. All flashed, bridged, or repaired areas (as described in section 6.0) shall be coated again at this time, and during each subsequent coat.
 - 4.4. Wherever possible, coating shall be applied at least three (3) inches beyond the termination of polyester flashings or bridges, especially along parapet walls, penetrations, air handling equipment, and the like.
 - 4.5. The base coat may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 4.6. NanoTech Materials recommends the use of a darker color, like gray, for the base coat, as it cures much faster than a lighter color, such as white.
 - 4.7. If sprayed, the base coat (the first pass of the base coat if applied in multiple passes) shall be bankrolled as it is being applied in order to maximize adhesion to the substrate and to eliminate voids.
 - 4.8. The base coat shall be allowed to cure for at least two (2) hours, depending on temperature and humidity conditions, after which an inspection shall be performed. Any defects in the coating membrane shall be repaired with NanoTech Materials Cool Roof Coat or an approved building sealant.
5. NanoTech Materials Cool Roof Top Coat
 - 5.1. NanoTech Materials recommends that NanoTech Materials Cool Roof Coat shall be applied in one coat at 2.5 gallons per 100 square feet.
 - 5.2. The surface of the NanoTech Materials Cool Roof Coat base coat, and all subsequent coats, shall be free of all moisture, dirt, and debris before a subsequent coat is applied.
 - 5.3. The second coat of NanoTech Materials Cool Roof Coat shall be applied as soon as practical, within 24-72 hours of the application of the base coat.
 - 5.4. The second coat, and all subsequent coats, shall be applied at a right angle to the direction in which the previous coat was applied. For example, if the previous coat was applied with a north-south motion, the subsequent coat shall be applied with an east-west motion.
 - 5.5. The second coat, and all subsequent coats, shall be applied by conventional airless spray or roller at the rate specified to achieve the TDM minimum in a reasonable number of coats. Each coat shall completely mask the color of the previous coat.
 - 5.6. The second coat, and all subsequent coats, may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 5.7. Subsequent coats shall be applied by conventional airless spray or roller at the rate required to achieve the TDM minimum. It is essential to realize that the true surface area may be greater than the apparent surface area because of surface texture or profile. In order to achieve the TDM minimum on such a surface, the application rate must be increased appropriately.
 - 5.8. Each coat shall be allowed to cure for at least four (4) hours, depending upon temperature and humidity conditions, and inspected and repaired as necessary, before a subsequent coat is applied.

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6. The cured NanoTech Materials Cool Roof Coat elastomeric coating system membrane shall be TDM minimum in all areas and shall be free of all pinholes and defects.
7. Required spread rates for the NanoTech Materials Cool Roof Coat membrane are as follows:
 - 7.1. 10-year application: 2.5 gallons per 100 square feet of NanoTech Materials Cool Roof Coat total 20 dry mil average.
 - 7.2. 15-year application: 1.5 gallons per 100 square feet of NanoTech Materials Cool Roof Base Coat total 15 dry mil average. 2.5 gallons per 100 square feet of NanoTech Materials Cool Roof Coat total 20 dry mil average. Total system at 35 dry mil.
 - 7.3. 20-year application: 3.0 gallons per 100 square feet of NanoTech Cool Roof Base Coat total 30 dry mil average. 2.5 gallons per 100 square feet of NanoTech Materials Cool Roof Coat total 20 dry mil average. Total system at 50 dry mil.
 - 7.4. For the purposes of NanoTech Materials specifications, “pitched” refers to a roof with a minimum slope of 1 in 12.
8. Having completed the procedures specified above, and having achieved the TDM minimum in all areas, the NanoTech Materials Cool Roof Coat membrane shall be given adequate time to cure.
 - 8.1. Contractor shall carefully remove water from small ponding areas (“birdbaths”) with an air blower, without damaging the NanoTech Materials Cool Roof Coat membrane.
 - 8.2. Areas of gross ponding water shall have been addressed and eliminated prior to coating application, in accordance with commonly accepted waterproofing and roofing practices.

Section 8.0 Clean-Up

Upon completion of all work covered in this specification, and before the job is inspected, the contractor shall remove all equipment, material, and debris, leaving the area in an undamaged and acceptable condition. In no case shall the job be considered complete before the job site has been properly cleaned.

Section 9.0 Limitations

This system is to be used only in conjunction with commonly accepted waterproofing and roofing standards including but not limited to the following:

1. In order to qualify for a factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Materials Cool Roof Coat membrane must be continuous, and the membrane must meet the TDM minimum.
2. No application of component materials shall commence during inclement weather, when a precipitation appears imminent, when temperature is below 45°F, or when relative humidity exceeds 85%.
3. No material shall be applied to wet, dirty, or frozen surfaces.
4. Coating application shall not commence until all other trades are off of the roof.
5. Coating shall not be applied to areas of gross ponding water. Contractor shall address and eliminate areas of gross ponding water prior to coating application.
6. In conjunction with the final inspection, all debris, material, and equipment are to be removed, leaving the area in an undamaged and acceptable condition.

6.0 TPO Single-Ply Systems

This is a generic summary of NanoTech Material's more detailed TPO SINGLE-PLY SYSTEM SPECIFICATION. For warranty purposes, Approved Applicators are responsible for studying, understanding, and following the specification. As always, contact NanoTech Materials for technical assistance.

SURFACE PREPARATION

1. Make sure membrane has reasonable integrity and is secured to roof deck.
2. Pressure wash surface to be coated using TSP or other suitable cleaner and rinse with water.
3. Prime all non-painted or galvanized metal that will be coated (e.g., flashings, counter-flashing, air handlers, penetrations, and the like).
4. Prime TPO using NanoTech Materials TPO Primer
5. Bridge all gaps around roof deck, penetrations, flashings, holes, etc. with the following method to make sure that the NanoTech Materials Cool Roof Coat membrane will be continuous:
 - Brush a coat of NanoTech Materials Roof Sealant over both sides of gap.
 - Embed a strip of non-woven polyester fabric in NanoTech Materials Roof Sealant.
 - Brush a heavy coat of NanoTech Materials Roof Sealant over polyester, making sure that there are no wrinkles or fishmouths.
 - Allow to cure overnight. Inspect and repair as necessary.
 - As an alternative, apply NanoTech Materials TriSeam covering 4" above and below gap.

COATING APPLICATION

1. The surface to be coated must be clean and dry.
2. Apply NanoTech Materials Cool Roof Coat elastomeric roof coating with an airless sprayer or roller giving special attention to seams and bridged or repaired areas.
3. Use an appropriate number of coats to achieve the correct millage.
 - 10-year: 2.5 gallons of NanoTech Materials Cool Roof Coat per square total. One coat application. (20 DFT)
 - 15-year: 2 coats of NanoTech Materials Cool Roof Coat at 2.5 gallons per square total (56 wet mil overall and 40 dry mil overall)
 - 20-year: base coat at 1.5 gallons per square NanoTech Materials Cool Roof Base Coat (24 wet and 15 dry) 2 coats of NanoTech Materials Cool Roof Coat at 2.5 gallons per square (56 wet mil and 40 dry mil) Total dry mil at 55.
4. Allow each coat to dry, inspect and repair as necessary before applying the next coat.

LIMITATIONS

1. This procedure is to be used only in conjunction with commonly accepted roofing and waterproofing standards.
2. No material shall be applied to wet, dirty, or frozen surfaces, or to areas of gross ponding water.
3. NanoTech Materials shall not be applied during inclement weather, when precipitation appears imminent, when the temperature is below 45°F, when the relative humidity exceeds 85%, or within 4 hours of sundown. This does not apply to NanoTech Materials Rain Safe Leak Repair.
4. In order to qualify for factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Materials Cool Roof Coat membrane must be continuous, and the membrane must meet the TDM minimum.
5. In conjunction with the final inspection, all debris, material, and equipment are to be removed from the job site, leaving the area in an undamaged and acceptable condition.

Section 1.0 Scope

The intention of this specification is to outline procedures for the application of NanoTech Materials Cool Roof Coat elastomeric coating membrane for the purposes of waterproofing, protecting, extending the life, and/or renewing an existing TPO (Thermoplastic Polyolefin) single-ply substrate. This specification describes materials, methods, and conditions necessary for the proper installation of this membrane.

1. This integrated system complies with all model building codes for roofing. Additionally, it constitutes one of the most cost-effective methods of waterproofing, protecting, extending the life, and/or renewing commercial and industrial roofs.
2. This system is only to be used in conjunction with commonly accepted roofing and waterproofing standards.
3. Any substantial deviation from these specifications shall be referred to an authorized representative of NanoTech Materials.

Section 2.0 Materials

All materials shall be manufactured or approved by NanoTech Materials, and shall meet the following minimum specifications:

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1. NanoTech Materials Cool Roof Coat Elastomeric Coating

Vehicle Type	Acrylic
Solids (Volume)	71.8%
Elongation	312%
Permeance @ 45 mils	30.8 perms
Reflectivity (White)	97%

2. NanoTech Materials Roof Sealant Brush or Trowel Grade Sealant

Vehicle Type	100% Acrylic
Pigment to Vehicle Ratio	1.97 to 1
Solids (Volume)	70%
Elongation	325%

3. NanoTech Materials Rust Inhibiting Primer Rust Conversion Primer for Metal

Vehicle Type	Proprietary acrylic emulsion
Solids (Weight)	60.3%
Weight (per gallon)	11.90 lbs.
Color	Beige

4. NanoTech Materials TPO Primer

Vehicle Type	Resin Modified Rubber
Solids (Weight)	21
Weight (per gallon)	10.3 lbs.
Color	Red

5. Delivery and Storage

- 4.1. Materials shall be delivered in their original, tightly sealed containers or unopened packages, clearly labeled with the manufacturer's name, Underwriter's Laboratories file number, and—where appropriate—product identification and lot numbers.
- 4.2. Materials shall be kept from freezing, and shall be stored out of the weather, in their original tightly sealed containers or unopened packages, as recommended by the manufacturer.

Section 3.0 Contractor

1. The NanoTech Materials Cool Roof Coat elastomeric coating membrane shall be applied by a single, experienced, and competent contractor or applicator, approved by NanoTech Materials.
2. Contractor or applicator shall be responsible for selecting and supplying all labor and supervision, and shall be responsible for furnishing all materials required to complete the job satisfactorily, in accordance with manufacturer's specifications.
3. Contractor or applicator shall be responsible for assessing and determining the integrity of the existing substrate. All structural repairs (including, but not limited to, the installation or repair of insulation, crickets, scuppers, roof drains, one-way vents, and the like) as well as the elimination of areas of gross ponding water, shall be the exclusive responsibility of the contractor or applicator.
 - 3.1. All installations or repairs shall be completed before application of the NanoTech Materials Cool Roof Coat elastomeric coating membrane commences.
 - 3.2. The industry standard definition of gross ponding water is ½ inch or more of water, standing on a 100 square foot or more area, 24 hours or more after a precipitation. Contractor shall be responsible to address and eliminate all such areas before coating application commences.

- 3.3. All installations or repairs shall be performed in accordance with commonly accepted roofing and waterproofing standards and practices.
- 3.4. An authorized representative of NanoTech Materials may be consulted for technical assistance in such matters.

Section 4.0 Surface Preparation – Cleaning

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparation shall include, but shall not be limited to, the following:

1. All unnecessary and non-functional equipment, conduit, and debris shall be removed from the roof
2. All structural repairs or installations shall be completed before coating application commences.
 - 2.1. Crickets, roof drains, insulation, one-way vents, scuppers, roof deck, and the like, shall all be installed or repaired before coating application commences.
 - 2.2. Areas of gross ponding water shall have been addressed and eliminated before coating application commences. Consult section 3.3.2 of this specification for further details.
3. Contractor shall ensure that the PVC membrane, whether fully adhered or mechanically fastened, is adequately secured to the roof deck before commencing with coating application. An authorized representative of NanoTech Materials may be consulted for technical assistance in such matters.
4. PLEASE NOTE: During coating application procedures, NanoTech Materials Cool Roof Coat shall be applied a minimum of three (3) inches above the termination of all flashings, repairs, and bridges. That is, coating shall be applied to sections of parapet walls, the bases of air handling equipment, penetrations, and the like. These surfaces must be adequately prepared in order to ensure adhesion of the NanoTech Materials Cool Roof Coat membrane.
 - 4.1. All masonry surfaces to be coated shall be wire-brushed before pressure washing in order to remove all dust.
 - 4.2. All oxidized metallic surfaces to be coated shall be wire-brushed or otherwise abraded before pressure washing in order to remove as much rust and scale as possible.
5. The entire surface to be coated—including, but not limited to, sections of parapet walls, penetrations, air handling equipment, and the like—shall be pressure washed in order to remove all dust, dirt, debris, chalk, oil, tar, and the like from the substrate surface. A suitable cleaner, such as TSP, and a broom shall be used as necessary. If a cleaner is required, the surface shall be rinsed with water to remove residue.
6. Special care shall be taken with surfaces coated with aluminized asphalt. All poorly adhered leafed aluminum shall be removed by vigorous brushing in addition to pressure washing.

Section 5.0 Surface Preparation – Priming

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparations shall include, but shall not be limited to, the following:

Metallic Surfaces:

1. All metal flashings, expansion joints, penetrations, and other metallic surfaces that are to be coated shall be prepared according to the following procedure.
2. As much loose rust and scale as possible shall already have been removed by abrasion (wire brush or other suitable instrument) from oxidized areas.
3. Primer application shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, or when the relative humidity exceeds 85%. To provide adequate curing time, primer application shall terminate a minimum of two (2) hours before sundown.
4. Entire surface to be primed with NanoTech Materials Rust Inhibiting Primer rust conversion primer for metal shall be free of dust, dirt, tar, oil, moisture, frost, or any other material that would impair the adhesion of the primer to the substrate surface.
5. Using conventional airless spray equipment, brush, or roller, all galvanized, phosphated, and non-painted metallic surfaces that are to be coated—metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall be primed with NanoTech Materials Rust Inhibiting Primer rust conversion primer for metal, or equal, at a rate of 100 to 200 square feet per gallon.
6. At contractor's option, NanoTech Materials Rust Inhibiting Primer be applied to the seams first, leaving the panels unprimed until after the procedures outlined in section 6.0 are completed. If this option is chosen, the unprimed panels shall be primed, at the required application rate, and allowed adequate curing time, before coating application commences.
7. Primer shall be allowed to cure for approximately two (2) hours, depending upon temperature and relative humidity, after which an inspection shall be performed. Additional NanoTech Materials Rust Inhibiting Primer be applied to any areas where there are voids in the primer coat, in order to make the coat continuous.

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Aluminized Surfaces:

1. If aluminized asphalt cannot be completely removed by pressure washing and vigorous scrubbing, the area coated with aluminized asphalt shall be primed with a cutback asphalt or an asphalt primer, according to the following procedure:
 - 1.1. Primer application shall not commence during inclement weather, when a precipitation appears imminent, or when the temperature is below 45°F.
 - 1.2. All surfaces to be primed with cutback asphalt or asphalt primer shall be free of dust, dirt, debris, degraded asphalt, moisture, or any other material that would impair the adhesion of the cutback asphalt or asphalt primer to the substrate surface.
 - 1.3. Using conventional airless spray equipment, brushes, mops, or other suitable equipment, the entire aluminized asphalt surface shall be primed with cutback asphalt or asphalt primer at an approximate rate of 300 to 400 square feet per gallon.
 - 1.4. Primer shall be allowed to cure for at least 24 hours. Primer must be dry before coating application commences.
2. In order to minimize color bleed-through into the top coat, the following procedure should be followed (bleed-through will only affect the appearance, and not the integrity, the performance, nor any other physical property of the NanoTech Materials Cool Roof Coat membrane):
 - 2.1. If the entire surface to be coated has been primed, all surface preparation procedures (sections 4.0-6.0) shall be completed before starting this procedure. However, if only part of the entire surface to be coated has been primed, it may be desirable to complete this procedure before completing the rest of the surface preparations to allow additional time for curing.
 - 2.2. Using conventional airless spray equipment or rollers, apply a base coat of NanoTech Cool Roof Coating to the surfaces primed with cutback asphalt at an approximate application rate of 1.5 gallon per 100 square feet. NanoTech Materials recommends that a darker color, like gray, be used for this procedure, since this accelerates the curing process.
 - 2.3. It is possible that bleed-through will occur in this base coat, producing discoloration (“coffee stains”). Allowing the base coat sufficient extra curing time tends to lock the bleed into the base coat, preventing the bleed-through from continuing into the topcoats.

Section 6.0 Surface Preparation – Detailing

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparation shall include, but shall not be limited to, the following:

1. All structural repairs (including, but not limited to, the installation or repair of insulation, crickets, scuppers, roof drains, one-way vents, and the like) shall have been completed prior to detail work commencement. Areas of gross ponding water shall have been addressed and eliminated prior to detail work commencement.
2. Detail work shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, or when relative humidity exceeds 85%. To provide adequate curing time, detail work shall terminate a minimum of four (4) hours before sundown.
3. All asphaltic surfaces to be coated shall have already been primed, if necessary, with cutback asphalt or asphalt primer and shall have been allowed adequate curing time before detail work commences. Refer to section 5.0 of this specification for further details.
4. All galvanized, phosphated, and non-painted metallic surfaces to be coated—including, but not limited to, metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall have already been primed with NanoTech Materials Rust Inhibiting Primer, or equal, and shall have been allowed adequate curing time before detail work commences. Refer to section 5.0 of this specification for further details.
5. The entire surface to be coated shall be free of dust, dirt, tar, oil, moisture, frost, or any other material that would impair the adhesion of NanoTech Materials Cool Roof Coat or NanoTech Materials Roof Sealant to the substrate surface.
6. All penetrations, expansion joints, transitions, gaps on or adjacent to the roof deck, small holes, and the like, shall be flashed, bridged, or repaired according to one or the other following procedures
7. On a clean, dry surface, a light coat of NanoTech Materials Roof Sealant shall be applied to both sides of the area to be flashed, bridged, or repaired.
8. A strip of non-woven or spun polyester roofing cloth, of an appropriate width, shall be pressed down into the caulk, thus bridging the gap. It is important to ensure that there are no fishmouths or wrinkles in the polyester.
9. The polyester cloth shall then be completely covered with a second coat of NanoTech Materials Roof Sealant. This second coat shall completely cover the polyester cloth and shall be applied within the same working day as the application of the polyester cloth.
10. Narrow gaps and small holes may be sealed with NanoTech Materials Roof Sealant alone, without the use of polyester cloth.
11. After completing this procedure, the newly flashed or bridged areas shall be allowed to cure overnight. Before coating application

commences, all such areas shall be inspected and repaired, as necessary, with NanoTech Materials Roof Sealant or an approved building sealant.

12. NanoTech Materials Cool Roof Coat shall be applied over these areas during normal coating operation procedures.

Section 7.0 Coating Application

1. Coating application shall not commence during inclement weather, when a precipitation appears imminent, when temperature is below 45°F, or when relative humidity exceeds 85%. To provide adequate curing time, coating application shall terminate at least four (4) hours before sundown.
2. Entire surface to be coated shall be free of dust, dirt, tar, oil, moisture, frost or any other material that would impair the adhesion of NanoTech Materials Cool Roof Coat elastomeric coating to the substrate surface.
3. All metallic, asphaltic, or aluminized surfaces to be coated shall have been prepared in accordance with the procedures specified in sections 4.0-6.0 of this specification.
4. NanoTech Materials Cool Roof Coat elastomeric coating: Base Coat
 - 4.1. The base coat of NanoTech Materials Cool Roof Coat shall be applied at 1½ gallons per 100 square feet using conventional airless spray equipment or rollers.
 - 4.2. Subsequent coats for a 20-year system shall be applied at the same rate of 1.5 gallons per 100 square feet.
 - 4.3. Coating shall be applied so as to cover the substrate uniformly. All flashed, bridged, or repaired areas (as described in section 6.0) shall be coated again at this time, and during each subsequent coat.
 - 4.4. Wherever possible, coating shall be applied at least three (3) inches beyond the termination of polyester flashings or bridges, especially along parapet walls, penetrations, air handling equipment, and the like.
 - 4.5. The base coat may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 4.6. NanoTech Materials recommends the use of a darker color, like gray, for the base coat, as it cures much faster than a lighter color, such as white.
 - 4.7. If sprayed, the base coat (the first pass of the base coat if applied in multiple passes) shall be back rolled as it is being applied in order to maximize adhesion to the substrate and to eliminate voids.
 - 4.8. The base coat shall be allowed to cure for at least two (2) hours, depending on temperature and humidity conditions, after which an inspection shall be performed. Any defects in the coating membrane shall be repaired with NanoTech Materials Cool Roof Coat or an approved building sealant.
5. NanoTech Materials Cool Roof Coat elastomeric coating: Top Coat
 - 5.1. NanoTech Materials recommends that NanoTech Materials Cool Roof Coat shall be applied in one coat at 2.5 gallons per 100 square feet.
 - 5.2. The surface of the NanoTech Materials Cool Roof Base Coat, and all subsequent coats, shall be free of all moisture, dirt, and debris before a subsequent coat is applied.
 - 5.3. The second coat of NanoTech Materials Cool Roof Coat shall be applied as soon as practical, within 24-72 hours of the application of the base coat.
 - 5.4. The second coat, and all subsequent coats, shall be applied at a right angle to the direction in which the previous coat was applied. For example, if the previous coat was applied with a north-south motion, the subsequent coat shall be applied with an east-west motion.
 - 5.5. The second coat, and all subsequent coats, shall be applied by conventional airless spray or roller at the rate specified to achieve the TDM minimum in a reasonable number of coats. Each coat shall completely mask the color of the previous coat.
 - 5.6. The second coat, and all subsequent coats, may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 5.7. Subsequent coats shall be applied by conventional airless spray or roller at the rate required to achieve the TDM minimum. It is essential to realize that the true surface area may be greater than the apparent surface area because of surface texture or profile. In order to achieve the TDM minimum on such a surface, the application rate must be increased appropriately.

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- 5.8. Each coat shall be allowed to cure for at least four (4) hours, depending upon temperature and humidity conditions, and inspected and repaired as necessary, before a subsequent coat is applied.
6. The cured NanoTech Materials Cool Roof Coat elastomeric coating system membrane shall be TDM minimum in all areas and shall be free of all pinholes and defects.
7. Required spread rate for the NanoTech Materials Cool Roof Coat membrane are as follows:
 - 7.1. Contractor shall carefully remove water from small ponding areas (“birdbaths”) with an air blower, without damaging the NanoTech Materials Cool Roof Coat membrane.
 - 7.2. Areas of gross ponding water shall have been addressed and eliminated prior to coating application, in accordance with commonly accepted waterproofing and roofing practices.
 - 7.3. 20-year application: 3.0 gallons per 100 square feet of NanoTech Materials Cool Roof Coat Base Coat total 30 dry mil average. 2.5 gallons per 100 square feet of NanoTech Materials Cool Roof Coat total 20 dry mil average. Total system at 50 dry mil.
 - 7.4. For the purposes of NanoTech Materials specifications, “pitched” refers to a roof with a minimum slope of 1 in 12.
8. Having completed the procedures specified above, and having achieved the TDM minimum in all areas, the NanoTech Materials Cool Roof Coat membrane shall be given adequate time to cure.
 - 8.1. Contractor shall carefully remove water from small ponding areas (“birdbaths”) with an air blower, without damaging the NanoTech Materials Cool Roof Coat membrane.
 - 8.2. Areas of gross ponding water shall have been addressed and eliminated prior to coating application, in accordance with commonly accepted waterproofing and roofing practices.

Section 8.0 Clean-Up

Upon completion of all work covered in this specification, and before the job is inspected, the contractor shall remove all equipment, material, and debris, leaving the area in an undamaged and acceptable condition. In no case shall the job be considered complete before the job site has been properly cleaned.

Section 9.0 Limitations

This system is to be used only in conjunction with commonly accepted waterproofing and roofing standards including but not limited to the following:

1. In order to qualify for a factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Materials Cool Roof Coat membrane must be continuous, and the membrane must meet the TDM minimum.
2. No application of component materials shall commence during inclement weather, when a precipitation appears imminent, when temperature is below 45°F, or when relative humidity exceeds 85%.
3. No material shall be applied to wet, dirty, or frozen surfaces.
4. Coating application shall not commence until all other trades are off of the roof.
5. Coating shall not be applied to areas of gross ponding water. Contractor shall address and eliminate areas of gross ponding water prior to coating application.
6. In conjunction with the final inspection, all debris, material, and equipment are to be removed, leaving the area in an undamaged and acceptable condition.

7.0 EPDM Single-Ply Systems

This is a generic summary of NanoTech Material's more detailed EPDM SINGLE-PLY SYSTEM SPECIFICATION. For warranty purposes, Approved Applicators are responsible for studying, understanding, and following the specification. As always, contact NanoTech Materials for technical assistance.

SURFACE PREPARATION

1. Make sure the membrane has reasonable integrity and is secured to roof deck.
2. Pressure wash and power scrub surface to be coated using TSP or other suitable cleaner. Then pressure wash again and rinse with water.
3. Prime all non-painted or galvanized metal that will be coated (e.g., flashings, counterflashing, air handlers, penetrations, and the like).
4. Bridge all gaps around roof deck, penetrations, flashings, holes, etc. with the following method to make sure that the NanoTech Cool Roof Coat membrane will be continuous:
 - Brush a coat of NanoTech Materials Roof Sealant along either side of gap.
 - Embed a strip of non-woven polyester fabric in NanoTech Materials Roof Sealant.
 - Brush heavy coat of NanoTech Materials Roof Sealant over polyester, making sure that there are no wrinkles or fishmouths.
 - Allow to cure overnight. Inspect and repair as necessary.

COATING APPLICATION

1. The surface to be coated must be clean and dry.
2. Apply NanoTech Materials Cool Roof Coat elastomeric roof coating with an airless sprayer or roller, giving special attention to seams and bridged or repaired areas.
3. Use an appropriate number of coats to achieve the correct millage:
 - 10-year: 2.5 gallons of NanoTech Materials Cool Roof Coat per square total. One coat application. (20 DFT)
 - 15-year: 2 coats of NanoTech Materials Cool Roof Coat at 2.5 gallons per square total (56 wet mil overall and 40 dry mil overall)
 - 20-year: base coat at 1.5 gallons per square NanoTech Materials Base Coat (24 wet and 15 dry) 2 coats of NanoTech Materials Cool Roof Coat at 2.5 gallons per square (56 wet mil and 40 dry mil) Total dry mil at 55.
4. Allow each coat to dry, inspect and repair as necessary before applying the next coat.

LIMITATIONS

1. This procedure is to be used only in conjunction with commonly accepted roofing and waterproofing standards.
2. No material shall be applied to wet, dirty, or frozen surfaces, or to areas of gross ponding water.
3. NanoTech Materials Cool Roof Coating, NanoTech Materials Roof Sealant, and NanoTech Materials Rust Inhibiting Primer shall not be applied during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, when the relative humidity exceeds 85%, or within 4 hours of sundown.
4. To qualify for factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Materials Cool Roof Coat membrane must be continuous, and the membrane must meet the TDM minimum.
5. With white EPDM, an adhesion test must be performed and approved by NanoTech Materials prior to application.
6. In conjunction with the final inspection, all debris, material, and equipment are to be removed from the job site, leaving the area in an undamaged and acceptable condition.

Section 1.0 Scope

The intention of this specification is to outline procedures for the application of an NanoTech Materials Cool Roof Coat elastomeric coating membrane for the purposes of waterproofing, protecting, extending the life, and/or renewing an existing EPDM (ethylene propylene diene terpolymer) single-ply substrate. This specification describes materials, methods, and conditions necessary for the proper installation of this membrane.

1. This integrated system complies with all model building codes for roofing. Additionally, it constitutes one of the most cost-effective methods of waterproofing, protecting, extending the life, and/or renewing commercial and industrial roofs.
2. This system is only to be used in conjunction with commonly accepted roofing and waterproofing standards.
3. Any substantial deviation from these specifications shall be referred to an authorized representative of NanoTech Materials.

Section 2.0 Materials

All materials shall be manufactured or approved by NanoTech Materials, and shall meet the following minimum specifications:

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1. NanoTech Materials Cool Roof Coat Elastomeric Coating

Vehicle Type	Acrylic
Solids (Volume)	71.8%
Elongation	312%
Permeance @ 45 mils	30.8 perms
Reflectivity (White)	97%

2. NanoTech Materials Roof Sealant Brush or Trowel Grade Sealant

Vehicle Type	100% Acrylic
Pigment to Vehicle Ratio	1.97 to 1
Solids (Volume)	70%
Elongation	325%

3. NanoTech Materials Rust Inhibiting Primer Rust Conversion Primer for Metal

Vehicle Type	Proprietary acrylic emulsion
Solids (Weight)	60.3%
Weight (per gallon)	11.90 lbs.
Color	Beige

4. Delivery and Storage

- 4.1. Materials shall be delivered in their original, tightly sealed containers or unopened packages, clearly labeled with the manufacturer's name, Underwriter's Laboratories file number, and—where appropriate—product identification and lot numbers.
- 4.2. Materials shall be kept from freezing, and shall be stored out of the weather, in their original tightly sealed containers or unopened packages, as recommended by the manufacturer.

Section 3.0 Contractor

1. The NanoTech Materials Cool Roof Coat elastomeric coating membrane shall be applied by a single, experienced, and competent contractor or applicator, approved by NanoTech Materials.
2. Contractor or applicator shall be responsible for selecting and supplying all labor and supervision, and shall be responsible for furnishing all materials required to complete the job satisfactorily, in accordance with manufacturer's specifications.
3. Contractor or applicator shall be responsible for assessing and determining the integrity of the existing substrate. All structural repairs (including, but not limited to, the installation or repair of insulation, crickets, scuppers, roof drains, one-way vents, and the like) as well as the elimination of areas of gross ponding water, shall be the exclusive responsibility of the contractor or applicator.
 - 3.1. All installations or repairs shall be completed before coating application commences.
 - 3.2. The industry standard definition of gross ponding water is ½ inch or more of water, standing on a 100 square foot or more area, 24 hours or more after a precipitation. Contractor shall be responsible to address and eliminate all such areas before coating application commences.
 - 3.3. All installations or repairs shall be performed in accordance with commonly accepted roofing and waterproofing standards and practices.
 - 3.4. An authorized representative of NanoTech Materials may be consulted for technical assistance in such matters.

Section 4.0 Surface Preparation – Cleaning

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparation shall include, but shall not be limited to, the following:

1. All unnecessary and non-functional equipment, conduit, and debris shall be removed from the roof.
2. All structural repairs or installations shall be completed before coating application commences.
 - 2.1. Crickets, roof drains, insulation, one-way vents, scuppers, roof deck, and the like, shall all be installed or repaired before coating application commences.
 - 2.2. Areas of gross ponding water shall have been addressed and eliminated before coating application commences. Consult section 3.3.2 of this specification for further details.
 - 2.3. Contractor shall ensure that the EPDM membrane, whether fully adhered or mechanically fastened, is adequately secured to the roof deck before commencing with coating application. An authorized representative of NanoTech Materials may be consulted for technical assistance in such matters.
3. PLEASE NOTE: During coating application procedures, NanoTech Materials Cool Roof Coat shall be applied a minimum of three (3) inches above the termination of all flashings, repairs, and bridges. That is, coating shall be applied to sections of parapet walls, the bases of air handling equipment, penetrations, and the like. Section 7.0 of this specification should be consulted for details. These surfaces must be adequately prepared in order to ensure adhesion of the NanoTech Materials Cool Roof Coat membrane.
 - 3.1. All masonry surfaces to be coated shall be wire-brushed before pressure washing in order to remove all dust.
 - 3.2. All oxidized metallic surfaces to be coated shall be wire-brushed or otherwise abraded before pressure washing in order to remove as much rust and scale as possible.
4. The entire surface to be coated—including, but not limited to, sections of parapet walls, penetrations, air handling equipment, and the like—shall be pressure washed, power scrubbed, and pressure washed again, in order to remove all dust, dirt, debris, chalk, oil, tar, and the like from the substrate surface. A suitable cleaner, such as TSP, shall be used as necessary. The surface shall then be rinsed with water to remove residue.
5. Special care shall be taken with surfaces coated with aluminized asphalt. All poorly adhered leafed aluminum shall be removed by power brushing and pressure washing.

Section 5.0 Surface Preparation – Priming

Preparations shall include all requirements specified by to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparations shall include, but shall not be limited to, the following:

PLEASE NOTE: During coating application procedures, NanoTech Materials Cool Roof Coat shall be applied a minimum of three (3) inches above the termination of all flashings, repairs, and bridges. That is, coating shall be applied to sections of parapet walls, the bases of air handling equipment, penetrations, and the like. Section 7.0 of this specification should be consulted for details. These surfaces must be adequately prepared in order to ensure adhesion of the NanoTech Materials Cool Roof Coat membrane.

1. All metal flashings, expansion joints, penetrations, and other metallic surfaces that are to be coated shall be prepared according to the following procedure
2. As much loose rust and scale as possible shall already have been removed by abrasion (wire brush or other suitable instrument) from oxidized areas.
3. Primer application shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, or when the relative humidity exceeds 85%. To provide adequate curing time, primer application shall terminate a minimum of two (2) hours before sundown.
4. Entire surface to be primed with NanoTech Materials Rust Inhibiting Primer for metal shall be free of dust, dirt, tar, oil, moisture, frost, or any other material that would impair the adhesion of the primer to the substrate surface.
5. Using conventional airless spray equipment, brush, or roller, all galvanized, phosphated, and non-painted metallic surfaces that are to be coated—metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall be primed with NanoTech Materials Rust Inhibiting Primer metal, or equal, at a rate of 100 to 200 square feet per gallon.
6. At contractor's option, NanoTech Materials Rust Inhibiting Primer may be applied to the seams first, leaving the panels unprimed until after the procedures outlined in section 6.0 are completed. If this option is chosen, the unprimed panels shall be primed, at the required application rate, and allowed adequate curing time, before coating application commences.
7. Primer shall be allowed to cure for approximately two (2) hours, depending upon temperature and relative humidity, after which an inspection shall be performed. Additional NanoTech Materials Rust Inhibiting Primer shall be applied to any areas where there are voids in the primer coat, in order to make the coat continuous.

Aluminized Surfaces:

1. If aluminized asphalt cannot be completely removed by pressure washing and vigorous scrubbing, the area coated with aluminized asphalt shall be primed with a cutback asphalt or an asphalt primer, according to the following procedure:

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- 1.1. Primer application shall not commence during inclement weather, when a precipitation appears imminent, or when the temperature is below 45°F.
 - 1.2. All surfaces to be primed with cutback asphalt or asphalt primer shall be free of dust, dirt, debris, degraded asphalt, moisture, or any other material that would impair the adhesion of the cutback asphalt or asphalt primer to the substrate surface.
 - 1.3. Using conventional airless spray equipment, brushes, mops, or other suitable equipment, the entire aluminized asphalt surface shall be primed with cutback asphalt or asphalt primer at an approximate rate of 300 to 400 square feet per gallon.
 - 1.4. Primer shall be allowed to cure for at least 24 hours. Primer must be dry before coating application commences.
2. In order to minimize color bleed-through into the top coat, the following procedure should be followed (bleed-through will only affect the appearance, and not the integrity, the performance, nor any other physical property of the NanoTech Materials Cool Roof Coat membrane):
- 2.1. If the entire surface to be coated has been primed, all surface preparation procedures (sections 4.0-6.0) shall be completed before starting this procedure. However, if only part of the entire surface to be coated has been primed, it may be desirable to complete this procedure before completing the rest of the surface preparations to allow additional time for curing.
 - 2.2. Using conventional airless spray equipment or rollers, apply a base coat of NanoTech Materials Cool Roof Coat to the surfaces primed with cutback asphalt at an approximate application rate of 1 gallon per 100 square feet. NanoTech Materials recommends that a darker color, like gray, be used for this procedure, since this accelerates the curing process.
 - 2.3. It is possible that bleed-through will occur in this base coat, producing discoloration (“coffee stains”). Allowing the base coat sufficient extra curing time tends to lock the bleed into the base coat, preventing the bleed-through from continuing into the top coats.

Section 6.0 Surface Preparation – Detailing

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Materials Cool Roof Coat elastomeric coating membrane to the substrate surface. Preparation shall include, but shall not be limited to, the following:

1. All structural repairs (including, but not limited to, the installation or repair of insulation, crickets, scuppers, roof drains, one-way vents, and the like) shall have been completed prior to detail work commencement. Areas of gross ponding water shall have been addressed and eliminated prior to detail work commencement.
2. Detail work shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 45°F, or when relative humidity exceeds 85%. To provide adequate curing time, detail work shall terminate a minimum of four (4) hours before sundown.
3. All asphaltic surfaces to be coated shall have already been primed, if necessary, with cutback asphalt or asphalt primer and shall have been allowed adequate curing time before detail work commences. Refer to section 5.0 of this specification for further details.
4. All galvanized, phosphated, and non-painted metallic surfaces to be coated—including, but not limited to, metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall have already been primed with NanoTech Materials Rust Inhibiting Primer corrosion inhibiting primer, or equal, and shall have been allowed adequate curing time before detail work commences. Refer to section 5.0 of this specification for further details.
5. The entire surface to be coated shall be free of dust, dirt, tar, oil, moisture, frost, or any other material that would impair the adhesion of NanoTech Materials Cool Roof Coat or NanoTech Materials Roof Sealant to the substrate surface.
6. All penetrations, expansion joints, transitions, gaps on or adjacent to the roof deck, small holes, and the like, shall be flashed, bridged, or repaired according to the following procedure:
 - 6.1. On a clean, dry surface, a light coat of NanoTech Materials Roof Sealant shall be applied to both sides of the area to be flashed, bridged, or repaired.
7. A strip of non-woven or spun polyester roofing cloth, of an appropriate width, shall be pressed down into the caulk, thus bridging the gap. It is important to ensure that there are no fishmouths or wrinkles in the polyester.
8. The polyester cloth shall then be completely covered with a second coat of NanoTech Materials Roof Sealant. This second coat shall completely cover the polyester cloth, and shall be applied within the same working day as the application of the polyester cloth.
9. Narrow gaps and small holes may be sealed with NanoTech Materials Roof Sealant alone, without the use of polyester cloth.
10. After completing this procedure, the newly flashed or bridged areas shall be allowed to cure overnight. Before coating application commences, all such areas shall be inspected and repaired, as necessary, with NanoTech Materials Roof Sealant or NanoTech Materials TriSeam.
11. NanoTech Materials Cool Roof Coat shall be applied over these areas during normal coating operation procedures.

Section 7.0 Coating Application

1. Coating application shall not commence during inclement weather, when a precipitation appears imminent, when temperature is below 45°F, or when relative humidity exceeds 85%. To provide adequate curing time, coating application shall terminate at least four (4) hours before sundown.
2. Entire surface to be coated shall be free of dust, dirt, tar, oil, moisture, frost or any other material that would impair the adhesion of NanoTech Materials Cool Roof Coat elastomeric coating to the substrate surface.
3. All metallic, asphaltic, or aluminized surfaces to be coated shall have been prepared in accordance with the procedures specified in sections 4.0-6.0 of this specification.
4. If EPDM substrate is white, an adhesion test on the cleaned membrane must be performed and approved by NanoTech Materials prior to coating application.
5. NanoTech Materials Cool Roof Coat elastomeric coating: Base Coat
 - 5.1. The base coat of NanoTech Materials Cool Roof Coat shall be applied at 1½ gallons per 100 square feet using conventional airless spray equipment or rollers.
 - 5.2. Coating shall be applied so as to cover the substrate uniformly. All flashed, bridged or repaired areas (as described in section 6.0) shall be coated again at this time, and during each subsequent coat.
 - 5.3. Wherever possible, coating shall be applied at least three (3) inches beyond the termination of polyester flashings or bridges, especially along parapet walls, penetrations, air handling equipment, and the like.
 - 5.4. The base coat may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 5.5. NanoTech Materials recommends the use of a darker color, like gray, for the base coat, as it cures much faster than a lighter color, such as white.
 - 5.6. If sprayed, the base coat (the first pass of the base coat if applied in multiple passes) shall be backrolled as it is being applied in order to maximize adhesion to the substrate and to eliminate voids.
 - 5.7. The base coat shall be allowed to cure for at least two (2) hours, depending on temperature and humidity conditions, after which an inspection shall be performed. Any defects in the coating membrane shall be repaired with NanoTech Materials Cool Roof Coat or an approved building sealant.
6. NanoTech Materials Cool Roof Coat elastomeric coating: Subsequent Coats
 - 6.1. NanoTech Materials recommends that NanoTech Materials Cool Roof Coat coating be applied in contrasting color coats to improve coverage and spray pattern. Order of application shall be as contractor specifies.
 - 6.2. The surface of the NanoTech Materials Cool Roof Coat base coat, and all subsequent coats, shall be free of all moisture, dirt, and debris before a subsequent coat is applied.
 - 6.3. The second coat of NanoTech Materials Cool Roof Coat shall be applied as soon as practical, within 24-72 hours of the application of the base coat.
 - 6.4. The second coat, and all subsequent coats, shall be applied at a right angle to the direction in which the previous coat was applied. For example, if the previous coat was applied with a north-south motion, the subsequent coat shall be applied with an east-west motion.
 - 6.5. The second coat, and all subsequent coats, shall be applied by conventional airless spray or roller at the rate specified to achieve the TDM minimum in a reasonable number of coats. Each coat shall completely mask the color of the previous coat.
 - 6.6. The second coat, and all subsequent coats, may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 6.7. Subsequent coats shall be applied by conventional airless spray or roller at the rate required to achieve the TDM minimum. It is essential to realize that the true surface area may be greater than the apparent surface area because of surface texture or profile. In order to achieve the TDM minimum on such a surface, the application rate must be increased appropriately.
7. The cured NanoTech Materials Cool Roof Coat elastomeric coating system membrane shall be TDM minimum in all areas and shall be free of all pinholes and defects.
8. Having completed the procedures specified above, and having achieved the TDM minimum in all areas, the NanoTech Materials Cool Roof Coat membrane shall be given adequate time to cure.

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- 8.1. Contractor shall carefully remove water from small ponding areas (“birdbaths”) with an air blower, without damaging the NanoTech Materials Cool Roof Coat membrane.
- 8.2. Areas of gross ponding water shall have been addressed and eliminated prior to coating application, in accordance with commonly accepted waterproofing and roofing practices.

Section 8.0 Clean-Up

Upon completion of all work covered in this specification, and before the job is inspected, the contractor shall remove all equipment, material, and debris, leaving the area in an undamaged and acceptable condition. In no case shall the job be considered complete before the job site has been properly cleaned.

Section 9.0 Limitations

This system is to be used only in conjunction with commonly accepted waterproofing and roofing standards including but not limited to the following:

1. In order to qualify for a factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Materials Cool Roof Coat membrane must be continuous, and the membrane must meet the TDM minimum.
2. With white EPDM, an adhesion test must be performed and approved by NanoTech Materials prior to application.
3. No application of component materials shall commence during inclement weather, when a precipitation appears imminent, when temperature is below 45°F, or when relative humidity exceeds 85%.
4. No material shall be applied to wet, dirty, or frozen surfaces.
5. Coating application shall not commence until all other trades are off of the roof.
6. Coating shall not be applied to areas of gross ponding water. Contractor shall address and eliminate areas of gross ponding water prior to coating application.
7. In conjunction with the final inspection, all debris, material, and equipment are to be removed, leaving the area in an undamaged and acceptable condition.

8.0 Structural Concrete System

This is a generic summary of NanoTech Material's more detailed STRUCTURAL CONCRETE ROOF SYSTEM SPECIFICATION. For warranty purposes, Approved Applicators are responsible for studying, understanding, and following the specification. As always, contact NanoTech Materials for technical assistance.

SURFACE PREPARATION

1. Pressure wash surface to be coated using NanoTech Roof Cleaner and fresh water.
2. Prime all galvanized or non-painted metal with NanoTech Materials Rust Inhibiting Primer and allow to dry. When estimating materials, assume an application rate of 0.4 gallons per square (200 square feet per gallon).
3. Seal all gaps around roof deck, flashings, and holes with NanoTech Roof Sealant or TriSeam

COATING APPLICATION

1. The surface to be coated must be clean and dry.
2. Apply NanoTech Cool Roof Coating elastomeric roof coating with an airless sprayer, giving special attention to seams and bridged or repaired areas.
3. Use an appropriate number of coats to achieve the correct millage; however, one must use a minimum of two coats.
 - 10-year: 2.5 gallons of NanoTech Cool Roof Coating per square total. One coat application. (20 DFT)
 - 15-year: 1.5 gallons of NanoTech Cool Roof Base Coat per square total. 2.5 gallons of NanoTech Cool Roof Coating per square total. Two coat application. (35 DFT)
 - 20-year: 3 gallons of NanoTech Cool Roof Base Coat per square total. 2.5 gallons of NanoTech Cool Roof Coating per square total. Three coat application. (50DFT)
4. Allow each coat to dry, inspect and repair as necessary before applying next coat.

LIMITATIONS

1. This procedure is to be used only in conjunction with commonly accepted roofing and waterproofing standards.
2. Nanotech Materials shall not be applied during inclement weather, when a precipitation appears imminent, when the temperature is below 40 F, when the relative humidity exceeds 85%, or within 4 hours of sundown.
3. In order to qualify for an NDL warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Cool Roof Coating membrane must be continuous, and the membrane must meet the TDM minimum.
4. In conjunction with the final inspection, remove all debris, material, and equipment from the job site, leaving the area in an undamaged and acceptable condition.

Section 1.0 Scope

The intention of this specification is to outline procedures for the application of a NanoTech Cool Roof Coating elastomeric coating membrane for the purposes of waterproofing, protecting, extending the life, and/or renewing an existing horizontal concrete roof substrate. This specification describes materials, methods, and conditions necessary for the proper installation of this membrane.

1. This integrated system complies with all model building codes for roofing. Additionally, it constitutes one of the most cost-effective methods of waterproofing, protecting, extending the life, and/or renewing commercial and industrial roofs.
2. This system is to be used only in conjunction with commonly accepted roofing and waterproofing standards.
3. Any substantial deviation from these specifications shall be referred to the authorized representatives of NanoTech Materials.

Section 2.0 Materials

All materials shall be manufactured or approved by NanoTech Materials, and shall meet the following minimum specifications:

1. NanoTech Materials Cool Roof Coat Elastomeric Coating

Vehicle Type	Acrylic
Solids (Volume)	71.8%
Elongation	312%
Permeance @ 45 mils	30.8 perms
Reflectivity (White)	97%

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2. NanoTech Materials TriSeam

Vehicle Type	Fiber Reinforced Acrylic
Pigment to Vehicle Ratio	1.5 to 1
Solids (Volume)	63%
Elongation	360%
Tensile Strength	304 psi

3. NanoTech Materials Roof Sealant Brush or Trowel Grade Sealant

Vehicle Type	100% Acrylic
Pigment to Vehicle Ratio	1.97 to 1
Solids (Volume)	70%
Elongation	325%

4. NanoTech Materials Rust Inhibiting Primer Rust Conversion Primer for Metal

Vehicle Type	Proprietary acrylic emulsion
Solids (Weight)	60.3%
Weight (per gallon)	11.90 lbs.
Color	Beige

5. Delivery and Storage

- 5.1. Materials shall be delivered in their original, tightly sealed containers or unopened packages, clearly labeled with the manufacturer's name, Underwriter's Laboratories file number, and—where appropriate—product identification and lot numbers.
- 5.2. Materials shall be kept from freezing, and shall be stored out of the weather, in their original tightly sealed containers or unopened packages, as recommended by the manufacturer.

Section 3.0 Contractor

1. The NanoTech Cool Roof Coating elastomeric coating membrane shall be applied by a single, experienced, and competent contractor or applicator, approved by NanoTech Materials.
2. Contractor or applicator shall be responsible for selecting and supplying all labor and supervision, and shall be responsible for furnishing all materials required to complete the job satisfactorily, in accordance with manufacturer's specifications.
3. Contractor or applicator shall be responsible for assessing and determining the integrity of the existing substrate. All structural repairs (including, but not limited to, the installation or repair of insulation, crickets, scuppers, roof drains, one-way vents, and the like) as well as the elimination of areas of gross ponding water, shall be the exclusive responsibility of the contractor or applicator.
 - 3.1. All installations or repairs shall be completed before application of the NanoTech Cool Roof Coating elastomeric coating membrane commences.
 - 3.2. The industry standard definition of gross ponding water is ½ inch or more of water, standing on a 100 square foot or more area, 24 hours or more after a precipitation. Contractor shall be responsible to address and eliminate all such areas before coating application commences.
 - 3.3. All installations or repairs shall be performed in accordance with commonly accepted roofing and waterproofing standards and practices.
 - 3.4. An authorized representative of NanoTech Materials may be consulted for technical assistance in such matters.

Section 4.0 Surface Preparation – Cleaning

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Cool Roof Coating elastomeric coating membrane to the substrate surface.

Preparation shall include, but shall not be limited to, the following:

1. All unnecessary and non-functional equipment, conduit, and debris shall be removed from the roof.
2. All structural repairs or installations shall be completed before coating application commences.
 - 2.1. Crickets, roof drains, insulation, one-way vents, scuppers, roof deck, and the like, shall all be installed or repaired before coating application commences.
 - 2.2. Areas of gross ponding water shall have been addressed and eliminated before coating application commences. Consult section 3.3.2 of this specification for further details.
3. PLEASE NOTE: During coating application procedures, NanoTech Cool Roof Coating elastomeric coating shall be applied a minimum of three (3) inches above the termination of all flashings, repairs, and bridges. That is, coating shall be applied to sections of parapet walls, the bases of air handling equipment, penetrations, and the like. Section 7.0 of this specification should be consulted for details. These surfaces must be adequately prepared in order to ensure adhesion of the NanoTech Cool Roof Coating membrane.
 - 3.1. All masonry surfaces to be coated shall be wire-brushed before pressure washing in order to remove all dust.
 - 3.2. All oxidized metallic surfaces to be coated shall be wire- brushed or otherwise abraded before pressure washing in order to remove as much rust and scale as possible.

Section 5.0 Surface Preparation – Priming

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Cool Roof Coating elastomeric coating membrane to the substrate surface. Preparations shall include, but shall not be limited to, the following:

Please Note: During coating application procedures, NanoTech Cool Roof Coating shall be applied a minimum of three (3) inches above the termination of all flashings, repairs, and bridges. That is, coating shall be applied to sections of parapet walls, the bases of air handling equipment, penetrations, and the like. Section 7.0 of this specification should be consulted for details. These surfaces must be adequately prepared in order to ensure adhesion of the NanoTech Cool Roof Coating membrane.

1. All metal flashings, expansion joints, penetrations, and other metallic surfaces that are to be coated shall be prepared according to the following procedure
2. As much loose rust and scale as possible shall already have been removed by abrasion (wire brush or other suitable instrument) from oxidized areas.
3. Primer application shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 40°F, or when the relative humidity exceeds 85%. To provide adequate curing time, primer application shall terminate a minimum of two (2) hours before sundown.
4. Entire surface to be primed with NanoTech Materials Rust Inhibiting Primer rust conversion primer for metal shall be free of dust, dirt, tar, oil, moisture, frost, or any other material that would impair the adhesion of the primer to the substrate surface.
5. Using conventional airless spray equipment, brush, or roller, all galvanized, phosphated, and non-painted metallic surfaces that are to be coated—metal flashings, expansion joints, air handling equipment, penetrations, and the like—shall be primed with NanoTech Materials Rust Inhibiting Primer rust conversion primer for metal, or equal, at a rate of 100 to 200 square feet per gallon.
6. At contractor's option, Nanotech Materials Rust Inhibiting Primer may be applied to the seams first, leaving the panels unprimed until after the procedures outlined in section 6.0 are completed. If this option is chosen, the unprimed panels shall be primed, at the required application rate, and allowed adequate curing time, before coating application commences.
7. Primer shall be allowed to cure for approximately two (2) hours, depending upon temperature and relative humidity, after which an inspection shall be performed. Additional NanoTech Materials Rust Inhibiting Primer shall be applied to any areas where there are voids in the primer coat, in order to make the coat continuous.

Section 6.0 Surface Preparation – Detailing

Preparations shall include all requirements specified by NanoTech Materials to ensure adequate adhesion of the NanoTech Cool Roof Coating elastomeric coating membrane to the substrate surface. Preparation shall include, but shall not be limited to, the following:

1. Detail work shall not commence during inclement weather, when a precipitation appears imminent, when the temperature is below 40°F, or when relative humidity exceeds 85%. To provide adequate curing time, detail work shall terminate a minimum of four (4) hours before sundown.
2. All galvanized, phosphated, and non-painted metallic surfaces to be coated—including, but not limited to, metal flashings,

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expansion joints, air handling equipment, penetrations, and the like—shall have already been primed with NanoTech Materials Rust Inhibiting Primer corrosion inhibiting primer, or equal, and allowed adequate curing time, before detail work commences.

3. The entire surface to be coated shall be free of dust, dirt, tar, oils, moisture, frost, or any other material that would impair the adhesion of NanoTech Cool Roof Coating elastomeric coating to the substrate surface.

Section 7.0 Coating Application

1. Coating application shall not commence during inclement weather, when a precipitation appears imminent, when temperature is below 40 OF, or when relative humidity exceeds 85%. To provide adequate curing time, coating application shall terminate at least four (4) hours before sundown.
2. Entire surface to be coated shall be free of dust, dirt, tar, oil, moisture, frost or any other material that would impair the adhesion of NanoTech Cool Roof Coating elastomeric coating to the substrate surface.
3. All metallic, asphaltic, or aluminized surfaces to be coated shall have been prepared in accordance with the procedures specified in sections 4-6.
4. NanoTech Cool Roof Coating elastomeric coating: Base Coat
 - 4.1. The base coat of NanoTech Cool Roof Coating elastomeric coating shall be applied at 1½ gallons per 100 square feet using conventional airless spray equipment.
 - 4.2. Coating shall be applied so as to cover the substrate uniformly. All flashed, bridged or repaired areas (as described in section 6) shall be coated again at this time, and during each subsequent coat.
 - 4.3. Wherever possible, coating shall be applied at least three (3) inches beyond the termination of polyester flashings or bridges, especially along parapet walls, penetrations, air handling equipment, and the like.
 - 4.4. The base coat may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 4.5. NanoTech Materials recommends the use of a darker color, like gray, for the base coat, as it cures much faster than a lighter color, such as white.
 - 4.6. The base coat shall be allowed to cure for at least two (2) hours, depending on temperature and humidity conditions, after which an inspection shall be performed. Any defects in the coating membrane shall be repaired with NanoTech Cool Roof Coating or an approved building sealant.
5. NanoTech Cool Roof Coating elastomeric coating: Subsequent Coats
 - 5.1. NanoTech Materials recommends that NanoTech Cool Roof Coating elastomeric coating be applied in contrasting color coats to improve coverage and spray pattern. Order of application shall be as contractor specifies.
 - 5.2. The surface of the NanoTech Cool Roof Coating base coat, and all subsequent coats, shall be free of all moisture, dirt, and debris before a subsequent coat is applied.
 - 5.3. The second coat of NanoTech Cool Roof Coating elastomeric coating shall be applied as soon as practical, within 24-72 hours of the application of the base coat.
 - 5.4. The second coat, and all subsequent coats, shall be applied at a right angle to the direction in which the previous coat was applied. For example, if the previous coat was applied with a north-south motion, the subsequent coat shall be applied with an east-west motion.
 - 5.5. The second coat, and all subsequent coats, shall be applied by conventional airless spray at the rate specified to achieve the TDM minimum in a reasonable number of coats. Each coat shall completely mask the color of the previous coat.
 - 5.6. The second coat, and all subsequent coats, may be applied in more than one pass, if desired, to accelerate curing, provided adequate curing time has been allowed between passes to prevent damage from being done to the membrane when it is walked upon.
 - 5.7. Subsequent coats shall be applied by conventional airless spray at the rate required to achieve the TDM minimum. It is essential to realize that the true surface area may be greater than the apparent surface area because of surface texture or profile. In order to achieve the TDM minimum on such a surface, the application rate must be increased appropriately.
 - 5.8. Each coat shall be allowed to cure for at least two (2) hours, depending upon temperature and humidity conditions, and inspected and repaired as necessary, before a subsequent coat is applied.

6. The cured NanoTech Cool Roof Coating elastomeric coating system membrane shall be TDM minimum in all areas and shall be free of all pinholes and defects.
 - 6.1. Contractor shall carefully remove water from small ponding areas (“birdbaths”) with an air blower, without damaging the NanoTech Cool Roof Coating membrane.
 - 6.2. Areas of gross ponding water shall have been addressed and eliminated prior to coating application with NanoTech Sub Slope Ponding Water Eliminator in accordance with commonly accepted waterproofing and roofing practices

Section 8.0 Clean-Up

Upon completion of all work covered in this specification, and before the job is inspected, the contractor shall remove all equipment, material, and debris, leaving the area in an undamaged and acceptable condition. In no case shall the job be considered complete before the jobsite has been properly cleaned.

Section 9.0 Limitations

1. This system is to be used only in conjunction with commonly accepted waterproofing and roofing standards including but not limited to the following:
2. In order to qualify for a factory warranty, applicator must have Approved Applicator status, the roof must meet the square foot minimum, the NanoTech Cool Roof Coating membrane must be continuous, and the membrane must meet the TDM minimum.
3. No application of component materials shall commence during inclement weather, when a precipitation appears imminent, when temperature is below 40°F, or when relative humidity exceeds 85%.
4. No material shall be applied to wet, dirty, or frozen surfaces.
5. Coating application shall not commence until all other trades are off of the roof.
6. Coating shall not be applied to areas of gross ponding water prior to coating application.
7. In conjunction with the final inspection, all debris, material and equipment are to be removed, leaving the area in an undamaged and acceptable condition.

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9.0 Technical Data Sheet

NanoTech Materials Cool Roof Coat

Revolutionary Acrylic Coating

Description

NanoTech Materials Cool Roof Coat is a high-performance, elastic polymeric coating used in the protection of roofs, walls, and buildings. The product acts in the direct protection of the surface and in the reduction of the heat absorbed from structures exposed to sunlight, due to its reflectance, emissivity, and low constant of thermal conductivity properties. Due to its efficiency, this product reduces the degradation caused by the incidence of UV radiation and allows the maintenance of flexibility, resistance, and longevity of existing roofing materials. As heat transfer is reduced, this product helps reduce energy consumption in buildings and also reduce the amount of carbon-based gases in the atmosphere from cooling systems.

Application

This product is primarily designed for outdoor use. For the application of this product, you must wear protective clothing, gloves, and glasses.

For a high-quality application, a minimum ambient temperature of 40°F and rising with a maximum relative humidity of 85% must be respected. Never apply the product at temperatures below 40°F, as the product is water-based, and freezing will cause irreversible damage. This product should not be exposed to rain, water, or any other liquids during application and for 48 hours after the final layer has been applied. See application manual for more details.

Before starting the application, repair the entire coverage of the roof with suitable products. When possible, the product should be applied on a clear and/or sunny day. Application can be carried out using a 3/4" external paint roller or professional airless sprayer. For a detailed application process, consult our application manual.

For quality and performance gains, the material should be applied in thin layers of at most 28 wet mils (typically one coat of an airless sprayer). Apply the second coat perpendicular to the first and so on. The consumption of the product will be 2.5 gallons per 100 square feet. On our 10-year warranty system coating should be applied 28 wet mils and dry film thickness (DFT) should be a minimum of 20 mils. For further details on our other warranty systems, please view our Cool Roof Coat Coverage Rates. Allow a minimum of 4 hours between coats. A complete cure requires takes 24 to 48 hours. All roof surfaces must maintain adequate drainage.

The product must be stored at temperature ranging from 40-100°F. Freezing will result in irreversible product loss.

Outstanding Features

- Water-based acrylic coating that significantly reduces heat transfer through the roof Significantly extends roof life
- High quality resin with 71% solids
- Reduces HVAC usage by up to 50%
- UV resistant, waterproof, no-crack flexibility, & up to 2" hail resistance
- Easy spray-on or roll-on application
- Engineered, designed, and assembled in the USA

Packaging

NanoTech Materials Cool Roof Coat is a high-performance, elastic polymeric coating used in the protection of roofs, walls, and generally, the product is packed in plastic 5-gallon bucket containers of product but can be packed in different types of packaging systems, such as 55-gallon drums and totes.

Maintenance

Damaged areas should be cleaned and free of loose debris. Damaged areas may be repaired by re-application of NanoTech Materials Rain Safe Leak Repair.

Precautions

Read the container label warning and Safety Data Sheet (SDS) for important health and safety information prior to the use of this product.

Technical Data

Color	White
Appearance	Emulsion
Aspect	White or Slightly Beige
Odor	There is no predominant odor
PH	Not applicable
Fusion Point	Not applicable
Freezing Point	In bucket: 32°F Applied and cured: -30°C
Initial Boiling Point	100°C
Evaporation Rate	<1
Flash Point	Not applicable
Flammability	Non-flammable
Lower/Upper Flammability and Explosive Limits	Not applicable
Vapor Pressure	No data available
Vapor Density	(Ar = 1) 3 for 4
Relative Density	Between 1.100 e 1,600 kg/m ³ (between 1.1 e 1.6 g/cm ³ density) a 15°C
Non-Volatile Solids	> 60%
Solubility in Water	Soluble in water
Auto-ignition Temperature	Not applicable
Decomposition Temperature	> 450°C
Viscosity	40,000 - 50,000 cP

Cool Roof Coat Application & Technical Manual

10.0 Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Cool Roof Coat
Product Use Description:	Acrylic coating that provides a thermal barrier for roofs
Chemical Family:	White elastomeric coating
Trade Name:	Nano Shield Cool Roof Coating
Material Number:	2022001
Manufacturer:	NanoTech Materials, Inc. 21401 Park Row Drive #360 Katy, TX 77449
Email:	info@nanotechmaterials.com
Telephone:	1-(888) 296-6266

2. HAZARDS IDENTIFICATION

GHS Classification

Carc. 2

GHS Label Elements

Hazard Pictograms:



Signal Word: Warning
Hazard Statements: (GHS-US):H351 - Suspected of causing cancer.

Precautionary Statements

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required.

Wear protective gloves and eye protection. If exposed or concerned: Get medical advice/attention. Store locked up.

Disposal: Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty clean containers which can be disposed of as non-hazardous waste.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture: Acrylic emulsion mixture
Substance Name: Roof Coating

CAS number

Not classified
 1309-48
 598-62-9
 7732-18-5
 Not classified
 1346-67-7
 N / A
 Not classified
 Not classified
 Not classified

Components

Water based resin
 Inorganic semiconductors
 Carbonate
 Water
 Nano Shield powder
 Alumina
 Inert pigment
 Thickener
 Defoamer
 Dispersant

% by Mass

15-50
 2 to 20
 10 to 50
 10 to 50
 2 to 20
 5 to 20
 5 to 30
 0.5 to 3.3
 0.1 to 2.6
 0.1 to 3.7

4. FIRST-AID MEASURES

Description of first aid measures

First-aid measures general:

Seek medical attention immediately. If you feel unwell after in contact with this product. When seeking medical advice show the medical practitioner the product label if possible. If exposed or concerned: Obtain medical advice/attention immediately.

First-aid measures after inhalation:

Remove person to fresh air and keep comfortable for breathing. Ensure fresh air breathing.

First-aid measures after skin contact:

Wash with water and soap. Rinse with water. Wash skin with plenty of running water.

First-aid measures after eye contact:

Obtain medical attention if pain, excessive blinking, or redness persists. Direct contact with the eyes is likely to be irritating. Rinse eyes with water as a precaution.

First-aid measures after ingestion:

Drink plenty of water. Get medical advice/attention. Call a poison center or a doctor if you feel unwell.

Most important symptoms and effects (both acute and delayed)

Symptoms/injuries:

Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/injuries after skin contact:

May cause moderate irritation.

Symptoms/injuries after eye contact:

Irritation of the eye tissue.

Symptoms/injuries after ingestion:

No data available.

Chronic symptoms:

No effects known.

5. FIRE-FIGHTING MEASURES

Product not combustible.

Extinguishing Media

Suitable Extinguishing Media:

Carbon dioxide, dry chemical, foam, water spray, fog.

Explosion Hazard:

Vapors are heavier than air and may travel along the ground to an ignition source some distance from material handling point. Ignition sources include pilot lights, smoking, heaters, electric motors, sparks from electrical switches, and static discharges.

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CAUTION:

Never use cutting torch on empty containers. Residual solvent vapor in empty containers may ignite or explode. Any application to hot surfaces requires special precautions. During emergency conditions, overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

Hazardous Combustion Products:

Carbon oxides (CO, CO₂). Oxides of aluminum. Oxides of titanium.

Reference to Other Sections:

Refer to section 9 for flammability properties.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Handle in accordance with good industrial hygiene and safety practice.

For Non-Emergency Personnel: Evacuate and isolate the area and prevent access. Remove ignition sources. No flames, smoking or flares in hazard area. Notify management. Avoid breathing vapor or mist and put on protective equipment. Control source of the leak.

For Emergency Personnel: See Section 8 for any specialized clothing recommendations.

Methods and material for containment and cleaning up:

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Absorb and/or contain spill with inert material.

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely.

Environmental Precautions:

Prevent entry to sewers and public waters.

7. HANDLING AND STORAGE

Precautions for Safe Handling:

Harmful or irritating material. Avoid contacting and avoid breathing the material. Use only in a well-ventilated area. As with all chemicals, good industrial hygiene practices should be followed when handling this material. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling.

Conditions for Safe Storage:

Store in a cool dry place. Keep container(s) closed.

Materials to Avoid:

Oxidizing agents.

Incompatibility:**Maximum Handling Temperature:**

Not determined.

Conditions for Safe Storage, Including Any Incompatibilities:

Technical measures: Comply with applicable regulations.

Storage conditions: Keep container closed when not in use. Store locked up. Store in a well-ventilated place. Keep cool.

Incompatible products: Strong bases. Strong acids.

Storage Temperature:

5 - 38°C

Storage Area:

Keep only in the original container. Protect against frost.

Special Rules on Packaging:

Keep only in original container. Meet all legal requirements.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters:

Not applicable.

Engineering Measures:

Not applicable.

Personal Protection

Appropriate engineering controls:	Ensure good ventilation of the workstation.
Recommended clothing - Skin Protection:	Gloves, long-sleeved shirt, and boots to prevent contact.
Breath protection:	Ventilation and dust mask are recommended when applying.
Hand protection:	Gloves - Recommended Use.
Eye Protection - Face:	Recommended wearing glasses.
Respiratory protection:	In case of insufficient ventilation, wear suitable respiratory equipment.
Environmental exposure controls:	Avoid release to the environment.
Other protective equipment:	Not required.
Thermal Dangers:	Not applicable.
Other information:	Do not eat, drink, or smoke during use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	Light beige
Appearance:	Emulsion
Aspect:	White or slightly beige.
Odor:	There is no predominant odor.
pH:	Not applicable.
Fusion point:	Not applicable.
Freezing point:	0°C
Initial boiling point:	100°C
Evaporation Rate:	<1
Flash point:	Not applicable.
Flammability:	Nonflammable.
Lower / Upper Flammability and Explosive Limits:	Not applicable.
Vapor pressure:	No data available.
Vapor density:	(Ar = 1) 3 para 4
Relative density:	Between 1,100 e 1,600 kg/m ³ (Between 1.1 e 1.6 g/cm ³ density) a 15°C
Non-volatile solids:	> 60%
Solubility in water:	Soluble in water.
Auto-ignition temperature:	Not applicable.
Decomposition Temperature:	> 150°C
Viscosity:	40,000 – 50,000 cP

10. STABILITY AND REACTIVITY

Reactivity:	Reacts at ambient temperatures and above 100°C.
Chemical Stability:	Stable at room temperature.

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Possibility of Hazardous Reactions:	Not applicable.
Conditions to Avoid:	Direct incidence of heat upon storage. Provide minimal natural ventilation of the environment.
Incompatible Materials:	Not applicable.
Unconcentrated acids and bases, dilute acid atmosphere:	Not applicable.
Hazardous Decompositions Products:	Not applicable.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:	Not applicable.
Skin corrosion / irritation:	Skin contact may cause mild irritation.
Serious eye damage / eye irritation:	Does not cause serious eye damage. Direct contact with eyes may cause irritation.
Respiratory or skin sensitization:	Not applicable.
Germ cell mutagenicity:	Not applicable.
Carcinogenicity:	Not applicable.
Reproductive toxicity:	Not applicable.
Specific target organ toxicity - single exposure:	Not applicable.
Specific target organ toxicity - repeated exposure:	Not applicable.
Aspiration hazard:	No inhalation hazards.

Component Toxicology Data

Chemical Component	Oral LD50	Dermal LD50	Inhalation LC50
Inorganic semiconductors	Oral LD50 Rat > 25,000 mg/kg	Dermal LD50 Rabbit > 10,000 mg/kg	Inhalation LC50 (4h) Rat > 6.82 mg/L

12. ECOLOGICAL INFORMATION

ECOLOGY – GENERAL:	The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.
ECOLOGY – WATER:	Very toxic to aquatic life with long lasting effects.
Eco toxicity:	Not applicable.
Persistence and degradability:	Not applicable.
Bio accumulative potential:	Not applicable.
Soil Mobility:	Not applicable.
Other adverse effects:	Not applicable.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods:	Dispose of contents/container in accordance with licensed collector's sorting instructions.
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Waste Disposal Recommendations:	Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to avoid release to the environment. Do not discharge into drains or the environment. Do not discharge into the sewer.
Ecology – Waste Materials:	Avoid release to the environment.
Recommended Methods for Final Destination:	Residues of this material do not constitute a hazard. It must be disposed of in an appropriate place. It should not be incinerated in sealed packaging.

14. TRANSPORT INFORMATION

Land:	It does not require specific regulation. It can be transported as a common cargo.
Hydro Ways:	It does not require specific regulation. It can be transported as a common cargo.
Air:	It does not require specific regulation.

15. REGULATORY INFORMATION

Specific health and environmental safety regulations for the chemical:	Not applicable.
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16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Important information, but not specifically described in previous sections:	Not applicable.
References:	Not applicable.
Further Information:	Note on the Chemical Weapons convention (CWC) Toxic Chemicals and Precursors List. None Known.

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11.0 ASTM Testing

ASTM Certifications for ICC, CRRC, and Miami-Dade

Tested by accredited 3rd party lab for Miami Dade.

NanoTech Testing Parameters

Test Parameter	ASTM D6083 Type I	ASTM D6083 Type II	Pass/Fail
Viscosity - ASTM D2196	12,000-85,000 cP	2000-100,000 cP	43000
Volume Solids - ASTM D2697	Greater than 50%	Greater Than 45%	Pass
Weight Solids - ASTM D1644	Greater than 60%	Greater Than 50%	Pass
% Elongation (Initial) - ASTM D2370	Min. 100%	Min. 100%	3.12
Tensile Strength (Initial) - ASTM D2370	Min. 200 psi	Min. 200 psi	Pass
% Elongation (1,000 hours - ASTM D2370	Min. 100%	Min. 100%	Pass
Permeance - ASTM D1653	Max. 50 perms	Max. 50 perms	Pass
Water Swelling - ASTM D471	Max. 20% (mass)	Max. 20% (mass)	0.049
Peel Strength - ASTM D903	2.0 lbf/in (wet)	2.0 lbf/in (wet)	16.3 lbf/in
Fungi Resistance - ASTM G21	Zero Rating	Zero Rating	0
Tear Resistance - ASTM D624	Greater than 60 lbf/in	Greater Than 60 lbf/in	77.6 lbf/in
Low Temperature Flexibility -(1,000 hours) - ASTM D522	Min. ½ in. at -26°C	Min. ½ in. at -10	Pass
Accelerated Weathering (1,000 hours) -ASTM D4798	No cracking or checking	No cracking or checking	Pass
Fire Rating – ASTM E108/ ASTM E84	Flame index spread = 5		Class A
	Smoke Developed Index = 15		
Hail Testing – TAS 114	Product meets the performance requirements to withstand a moderate hail event		Class MH

12.0 Warranty, Care and Preventative Maintenance

12.1 Limited Product Warranty

Warranty No. _____ Application No. _____ Effective Date _____ Term _____
 Owner _____ Applicator _____
 Area of Application _____ Gallons per square _____ Average Dry Mil _____
 Location of Structure _____
 Description of Structure _____
 Specifications _____

Subject to (i) the terms, conditions, exclusions and limitations herein, and (ii) the representations, warranties and covenants in Paragraphs 1 and 2 below being and remaining true and correct in all respects, NanoTech, Inc. (d/b/a NanoTech Materials Inc.), a Delaware corporation ("NanoTech"), warrants to the Owner set forth above ("Owner") that its NanoTech Cool Roof Coating membrane ("Product") will be free from defects in material and workmanship for the Term (as defined below) (the "Warranty"). Notwithstanding anything to the contrary herein, the Warranty will only take effect if and when executed and dated below by authorized representatives of NanoTech, the Applicator set forth above ("Applicator") and the Owner.

1. Representations, Warranties and Covenants of Applicator.

- Applicator represents, warrants and covenants to NanoTech that:
- a. it is a NanoTech Approved Applicator and has installed Product on the Structure set forth above (the "Structure") in accordance with NanoTech's specifications and instructions from time to time;
 - b. it has paid (a) NanoTech's invoice(s) for materials supplied by NanoTech in connection with application of Product to the Structure by Applicator, and (ii) all costs incurred by NanoTech in connection with inspection of the application of Product on the Structure in connection with NanoTech's evaluation of warranty suitability, including, without limitation, costs of travel, lodging and per diem for NanoTech's agents, employees and representatives;
 - c. it shall, for a period of ninety (90) days beginning on the later to occur of (i) the Effective Date listed above, (ii) the date of the completion of the application of Product to the Structure by the Applicator; and (iii) the date of written acceptance by Owner of the application of Product to the Structure (the latest date being the "Applicator Warranty Responsibility Start Date:"), be solely responsible for all materials costs and labor costs incurred by NanoTech with respect to the Warranty; and
 - d. it shall, for a period of two (2) years from the Applicator Warranty Responsibility Date, be solely responsible for all labor costs incurred by NanoTech with respect to the Warranty.

2. Representations, Warranties and Covenants of Owner.

- Owner represents, warrants and covenants to NanoTech that:
- a. it has paid Applicator's invoice(s) in connection with the application of Product to the Structure;
 - b. it has paid any additional charges to NanoTech payable in connection with the Warranty as indicated by NanoTech;
 - c. during the Term set forth above beginning on the Effective Date set forth above (the "Term"), should any damage or other event occur to Product that is outside the scope of the Warranty, it shall immediately notify NanoTech in writing of the same and provide NanoTech with any documentation reasonably requested by NanoTech with respect to the same; and
 - d. during the Term, it shall grant, during normal business hours, NanoTech, its agents, employees and representatives reasonable access to the Structure, including the roof.

3. Exclusions.

NanoTech will not be responsible under the Warranty for any failure of Product that results from external causes, including, without limitation, acts of God or nature, physical damage, exposure to adverse or hazardous chemicals or other substances, use of reactive or harsh cleaning agents, vandalism, fire, power failure or fluctuation,

induced vibration, animal or insect activity, fault or negligence of Applicator or Owner and/or any third party not engaged by NanoTech, improper or unauthorized application, alteration, maintenance or service, including, without limitation, failure to abide by any Product classifications or certifications, or failure to comply with any applicable standards, codes, recommendations, Product specification sheets, processes or materials supplied by a third party, or any other occurrences beyond NanoTech's reasonable Control. By way of illustration and example and not of limitation, the following are excluded from coverage under the Warranty:

- a. Natural disasters, including, without limitation, floods, lighting, hurricanes, hail greater than 2 inches in diameter (as reported by the National Climatic Data Center), windstorms, earthquakes, tornadoes, volcanic activity or other phenomena of the elements.
 - b. Damage to the NanoTech Cool Roof Coating membrane, the Structure, or to the property or contents caused by fire, settlement, movement, distortion, warpage, expansion, contraction, cracking, or other movement in the substrate.
 - c. Improper application or failure of any component underlying the NanoTech Cool Roof Coating membrane such as decks, drains, roof vents, roof insulation, flashings, vapor barriers and the like.
 - d. Erection or construction of any additional installation on or through the NanoTech Cool Roof Coating membrane.
 - e. Damage due to lack of proper drainage.
 - f. Damage resulting from infiltration or condensation of moisture, in, through, or around walls, copings, building structure or underlying or surrounding areas.
 - g. Damage due to test cuts not authorized by NanoTech.
 - h. Penetration, vandalism, damage or attack by third parties, foreign objects, or agents, including animal and plant life.
 - i. Discoloration or change in visual appearance due to accumulation or streaking of airborne materials deposited on the surface from the atmosphere.
 - j. Misuse or abuse of the NanoTech Cool Roof Coating membrane.
- 4. Claims; Exclusive Remedy.**

A claim under the Warranty must be submitted by Owner in writing to an authorized NanoTech post-sales or customer service representative no later than (10) days after discovery of the alleged defect or failure. If NanoTech determines (acting reasonably) that Product fails to comply with the terms of the Warranty, NanoTech, in its sole discretion, will either repair or replace Product with the same or a functionally equivalent product; provided, however, that if NanoTech is unable to, using commercially reasonable efforts, timely repair or replace Product with a functionally equivalent product, NanoTech reserves the right to refund to Owner the

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original purchase price paid by Applicator regarding Product. The Warranty is for the sole and exclusive benefit of Owner. The repair or replacement of Product (or refund of the original Applicator purchase price) is the sole and exclusive remedy for failure of Product to comply with the terms of the Warranty and does not extend the Term. THE FOREGOING WARRANTY TERMS ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, AND NANOTECH EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, RELATING DIRECTLY OR INDIRECTLY TO PRODUCT, WHETHER ORAL, WRITTEN, OR ARISING BY COURSE OF DEALING OR USAGE OF TRADE, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, TITLE OR INFRINGEMENT.

5. Limitation of Liability.

The total liability of NanoTech with respect to any and all claims of any kind, whether in contract, warranty, tort (including negligence), strict liability or otherwise, arising out of or in connection with, or resulting from, NanoTech's performance or breach of the Warranty, shall in no event exceed the purchase price paid by Applicator with respect to Product giving rise to the claim, and any and all such liability shall terminate upon the expiration of the Term.

6. No Consequential Damages.

IN NO EVENT SHALL NANOTECH BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY OR PUNITIVE DAMAGES, EVEN IF INFORMED OF THE POSSIBILITY OF SUCH DAMAGES, WHETHER AS THE RESULT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, OR ANY OTHER THEORY, INCLUDING, WITHOUT LIMITATION, LABOR OR EQUIPMENT REQUIRED TO REMOVE AND/OR REINSTALL ORIGINAL OR REPLACEMENT PARTS, LOSS OF TIME, PROFITS OR REVENUES, LACK OR LOSS OF PRODUCTIVITY, INTEREST CHARGES OR COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, SYSTEMS, SERVICES OR DOWNTIME COSTS, DAMAGE TO OR LOSS OF USE OF PROPERTY OR EQUIPMENT OR ANY INCONVENIENCE ARISING OUT OF ANY BREACH OF THE WARRANTY OR OBLIGATIONS UNDER THE WARRANTY.

7. Transferability.

The Warranty may not be transferred or assigned by Owner except as set forth in this paragraph. Owner may assign this Warranty to a subsequent owner of the Structure for the remaining period in the Term (if any) subject to satisfaction of the following conditions: (a) Owner makes a written request to NanoTech for transfer of the Warranty within sixty (60) days of the transfer of ownership of the Structure; (b) Owner permits NanoTech's agents, employees and representatives to inspect the Structure, including the roof, during normal business hours and Owner makes any repairs to the NanoTech Cool Roof Coating membrane or other roofing or building components that are determined by NanoTech (acting reasonable) to be necessary to preserve the integrity of the NanoTech Cool Roof Coating membrane; and (c) Owner pays to NanoTech an administrative processing fee of \$500. The Warranty is not otherwise transferable or assignable, whether by contract or operation of law, either directly or indirectly, and any attempt to do so shall automatically render the Warranty null and void.

8. Architectural/Engineering Disclaimer.

NanoTech does not practice engineering or architecture. Neither the issuance of the Warranty, nor review or inspection of (a) the Structure (including the roof), (b) the application of the NanoTech Cool Roof Coating membrane or (c) the plans for the roof, by NanoTech, shall constitute any warranty of such plans, specifications or construction, or the suitability or code compliance of the NanoTech Cool Roof Coating membrane for any particular structure, including the Structure.

9. Governing Law; Jurisdiction.

(a) The validity, interpretation, and performance of the Warranty shall be governed and construed in accordance with the laws of the State of Texas, excluding its conflict of laws provisions. (b) Any disputes arising with respect the Warranty shall be exclusively tried in the

courts sitting within Harris County, State of Texas, and the parties hereto hereby consent and submit to the exclusive jurisdiction of such courts for such purpose. (c) IN ANY LITIGATION BETWEEN THE PARTIES HERETO RELATED TO THE WARRANTY, SUCH PARTIES HEREBY: (i) WAIVE THEIR RIGHTS TO A JURY TRIAL AND (ii) STIPULATE THAT ANY TRIAL SHALL OCCUR WITHOUT A JURY.

NANOTECH, INC. (d/b/a NANOTECH MATERIALS INC.)

By: _____

Name: _____

Title: _____

Date: _____

AGREED AND ACCEPTED BY APPLICATOR:

[INSERT NAME OF COMPANY]

By: _____

Name: _____

Title: _____

Date: _____

AGREED AND ACCEPTED BY APPLICATOR:

[INSERT NAME OF COMPANY]

By: _____

Name: _____

Title: _____

Date: _____

12.2 Warranty Application



WARRANTY APPLICATION

General Information:

Building Owner: _____
 Contact Name: _____ Title(Position): _____
 Phone: _____ E-Mail: _____
 Project Name: _____ Address: _____
 City: _____ State: _____ Zip: _____
 Architect/Engineer: N/A _____ Phone: _____
 General Contractor: N/A _____ Phone: _____
 Applicator/Contractor: _____
 Contact Name: _____ Title(Position): _____
 Phone: _____ E-Mail: _____
 Address: _____ City: _____ State: _____ Zip: _____

System Information:

Substrate: Select _____ Coating System: Select _____
 Completion Date: _____ Area (square feet): _____ New Application Re-coat
 If the project is a "re-coat", provide coating manufacturer and type of coating: N/A
 Manufacturer: _____ Type of Coating: _____

Material Information:

Note: This application WILL NOT be processed without the following material information, pictures, and drawings.
If official drawings aren't available please provide Google earth with the area of work identified.

	First Coat	Second Coat	Third Coat	Fourth Coat	Total
Coating Name/Color					
Quantity (gal/sq)					
Wet Mil Avg. installed					

Warranty Information:

Length of Warranty: 5 years 10 years 15 years 20 years Other: _____
 Type of Warranty: System Warranty (No Dollar Limit) Material Only

Over Roof Information:

Moisture Detection: Core Samples; Select _____ Infra-red Thermography (Attach) Select _____
 Moisture Detected: Select _____ Total Area with Moisture: _____
 Interior Drains: Select _____ Exterior Drains/Scuppers: Select _____
 Penetrations: Roof; Select _____ Parpet/wall Select _____

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WARRANTY APPLICATION

Warranties by Electronic Signature:

To obtain and execute warranties digitally, please provide the information below. The digital option greatly expedites the warranty process. However, if you prefer to bypass this option, they can be processed via US mail.

Applicator Contact Name: _____ **Email:** _____

Owner Contract Name: _____ **Email:** _____

Signature (Officer of the Company) & Company Information

APPLICATOR CERTIFICATION: Applicator hereby represents and warrants that all of the information provided by Applicator is accurate and complete, and that the a NanoTech Materials products have been applied and maintained in accordance with NanoTech Materials' written guidelines and specifications and NanoTech Materials' confirmed recommendations.

Note: Warranty requests submitted later than 90 days from date of substantial completion are subject to a third party inspection at cost to the Applicator.

Signature: _____ Date: _____

Printed Name: _____ Title: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ E-Mail: _____

NanoTech Materials, Inc Approval

Signature: _____ Date: _____

21401 Park Row Suite Drive #360 Katy, TX 77449 | (888) 296-6266

For Office Use Only.

Cool Roof Coat: _____

Roof Sealant (Acrylics): _____

Roof Sealant (Silicones): _____

Rust Inhibiting Primer: _____

Cool Roof Base Coat: _____

TriSeam: _____

Roof Cleaner: _____

TPO Primer: _____

Rain Safe Leak Repair: _____

Skylight Sealer: _____

Sub Slope Silicone: _____

12.3 Care & Preventative Maintenance

Overview

A roof, constantly exposed to various weather elements like heat, cold, UV rays, and physical damage, is often one of the most vulnerable parts of a building's exterior. However, its long-term performance can be significantly enhanced through proper design, quality materials, correct installation, skilled workmanship, and a thorough maintenance program. The investment in a comprehensive maintenance plan is considerably less than the costs associated with repairing or replacing a damaged roofing system.

As a crucial component of the building envelope, the roofing system requires careful attention. Early identification and resolution of potential issues are key to preventing minor problems from escalating. Regular maintenance not only maintains the roof's integrity but also protects the building's contents and minimizes disruptions to its use. Consistent and detailed maintenance schedules can prolong the life of the roofing system and reduce overall life cycle and replacement costs.

Understanding the Importance of Proper Roof Maintenance and Repair

All roofing systems, including those that are coated, necessitate routine maintenance and repair. The Roof Coatings Manufacturers Association (RCMA) suggests inspecting roofs and coatings twice yearly, typically in spring and fall, as well as after significant weather events. Additional coating should be applied as needed to repair damage to the coating or the underlying roofing substrate. Application of extra coating is also advisable where the existing coating is worn thin. NanoTech Materials requires the application of a 20 mil (DFT) topcoat at the ten year inspection mark, in order to recertify the roof for another ten years.

General Care and Maintenance Recommendations

For optimal performance of the roofing system, consider the following general care and maintenance tips:

- Ensure proper drainage to reduce standing water on the roof. Keep the roof surface clear of leaves, pine needles, twigs, paper, dirt, and other debris that might clog drains. Trim back trees or branches that are too close to the roof. Standing water on the roof increases the likelihood of moisture infiltration in case of punctures or other mechanical damage to the roofing membrane.
- Regularly inspect the building's exterior for signs of settlement or movement. Cracks in walls could indicate potential issues with the roof substrate and flashing. Check the condition of overhangs, cornices, fascia, and edging.
- Protect the roofing system from substances that could cause early degradation of the coating or membrane, such as:
 - Petroleum-based liquids
 - Solvents
 - Grease from rooftop units or restaurant vents
 - Oils (new or old) from air conditioning or compressor units
 - Kitchen waste or animal fats
 - Chemicals – Contact Technical Support Services for information on chemicals incompatible with the coating
- Use catch pans or other protective measures to shield the roofing membrane from exposure to grease, chemicals, and other substances. Spills should be promptly cleaned to prevent swelling and possible degradation of the roofing system.
- Look for signs of algae, mold, mildew, or other plant growth on the roof, especially in shaded areas prone to water retention.
- If snow removal is necessary, use plastic shovels and exercise caution around protrusions or detailed work areas. Avoid using snow blowers, picks, axes, and sharp-edged shovels on the roof.
- Remove any foreign debris like glass, bolts, nails, screws, metal shavings, and other materials that could puncture or cut the liquid-applied coating or roofing system.
- Limit access to the roof. Most roof damage occurs due to unauthorized or uninformed individuals. Access should be restricted to authorized personnel only, and visitors and maintenance personnel should be informed about necessary precautions. Maintain a log of all visitors and maintenance personnel accessing the roof.
- Instruct maintenance personnel to avoid dropping tools and equipment on the coated roof surface to prevent puncturing the membrane. When working on rooftop HVAC units, antennas, solar panels, satellite dishes, etc., take care not to place tools, metal doors, lids, pans, or sharp objects directly on the coating system surface. Use smooth plywood to protect the coating membrane when moving roof-mounted units or equipment.
- The Building Owner is responsible for repairing any physical damage to the roofing system, either through the original contractor or another certified contractor. Delayed repairs to physical damage can lead to the need for major repairs or replacement of the roof or roof coating system at the Building Owner's expense.

Annual Inspections

- During annual inspections, be aware that the liquid-applied coating can become slippery in wet conditions. Caution is advised when walking on this type of roofing system or coating during or following rainfall, or in the presence of moisture such as dew, frost, or ice. Special attention is needed on lighter colored surfaces where ice or frost may not be as noticeable compared to darker surfaces.
- These involve cleaning and a thorough visual check of the roof coating system. Inspections should assess the overall condition of the coating, as well as the integrity of elements like flashings, vent pipes, protrusions, skylights, drains, gutters, parapet walls and caps, adjoining walls, and mechanical equipment. Additionally, look for signs of biological growth or any other foreign debris.

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Preventative Maintenance Program

- This program includes regular inspections and subsequent corrective measures, designed to extend the life of the roofing system. It's advisable to schedule these preventative maintenance inspections in spring and autumn. Preventative maintenance programs are recommended by the manufacturer but are included in the service contract and the responsibility of the installing contractor to coordinate with the end customer.

Additional Inspections

- Beyond regular annual inspections, additional checks should be planned if the roof encounters unusual physical damage or conditions, including but not limited to:
 - Exposure to extreme weather, such as strong winds, hail, or prolonged heavy rain.
 - Extensive water pooling, debris accumulation, and any damage to building components that might lead to moisture penetration of the roofing membrane. In areas affected by severe conditions, check the coating or liquid-applied system for punctures, tears, abrasions, or detachment.
 - Following repair or replacement of rooftop equipment or during other activities by different trades that could potentially damage the roof.
- It is important to check for spills, debris, sharp objects, punctures, excessive wear, or other damage caused by heavy traffic or alterations to the roof.

Cleaning Procedures

WARNING: Be cautious of the slippery nature of the liquid-applied coating when wet, especially during cleaning.

- Clear the roof of rocks, branches, leaves, pine needles, and other foreign materials, as well as dirt build-up near drains and other low points. Utilize tools like a plastic rake or a medium-bristle brush for debris removal, applying minimal pressure. Clear any blockages from drains, gutters, and downspouts, ensuring downspouts on multi-level roofs do not discharge directly onto the coated surface below. Trim overhanging trees to reduce leaf and pine needle accumulation and allow sunlight to reach the roof, aiding in the prevention of mildew and algae growth.
- Generously apply diluted Cleaning Concentrate (1 part concentrate to 10 parts water) at low pressure to a section of the roof, using about 0.4 to 0.7 gallons per 100 ft² (1.6 to 2.9 L/m²). Let the cleaner sit for at least 15 minutes. Ensure areas with algae, mold, or mildew are thoroughly soaked. These spots should also be scrubbed with a medium to stiff bristle brush for optimal removal.
- Rinse using a pressure washer (1,200 to 1,500 psi) with clean water directed towards drains. Employ a fan tip on the wand, maintaining a minimum distance of 12 inches (305 mm) from the roof surface. Additional scrubbing with a broom or cleaning pad may be required in dirtier low areas.

IMPORTANT: Use roof wash-off catchment systems where necessary and comply with local and state regulations during the cleaning process.

Pre-Inspection

- Before conducting the roof inspection, it's essential to prepare a detailed roof plan to document any defects and observations.
- Inspect the underside of the deck (if accessible) and the exterior of the building before accessing the roof. Look for indications of excessive moisture, staining, or deterioration. These signs can provide insights into not just roof-related issues but also other factors impacting the overall performance of the building envelope.

Area of Concern	Treatment
Parapet Walls & Caps	Inspect the interface between the roof deck and parapet walls to verify there are no splits or tears and that the coating membrane is properly adhered and intact. Check parapet walls and caps for cracks or breaks that might allow moisture intrusion beneath the coating system.
Minor Repairs	Areas requiring minor repairs (such as small punctures and tears) identified during the inspection can be fixed with NanoTech Materials Rain Safe Leak Repair or NanoTech Materials Roof Sealant.
Roof Drains & Scuppers	Confirm that roof drains and scuppers are unobstructed and free from debris for effective drainage. Ensure drain covers are secure and properly fastened. Check the surrounding coating for integrity and absence of blisters, tears, and delamination.

Protrusions	Scrutinize the reinforced coating around all protrusions, like vent pipes, for splits, tears, or delamination at the base. Confirm proper cap installation on vent pipes and the secure, self-flashing condition of the coating at the top of all protrusions.
Moisture Analysis (optional)	If there's concern about moisture penetration into the roof substrate due to damage, consider conducting a non-destructive moisture detection survey. Common methods include nuclear metering and infrared thermography. A moisture meter probe can also be used, though this is destructive and will require repair of the damage.
Skylights	Examine the reinforcement around skylights, ensuring it is intact and free of blisters, tears, and delamination.
Gutters	Maintain clean gutters, clear of debris to promote proper drainage. If drains are coated, inspect the coating for soundness and absence of blisters, tears, and delamination.
Roof Membrane & Flashings	Examine the roof coating membrane to ensure it is intact and undamaged, checking for splits, crazing, and cracking. In areas with standing water, inspect for blisters, delamination, or damage due to biological growth on the coating surface.
Roof Mounted Equipment	Inspect all rooftop equipment to ensure secure attachment to base risers, and that the surrounding coating and reinforcement is sound, free of blisters, tears, and delaminations.
Other Details	Check the condition of bricks and mortar on chimneys, as well as caulking or joints in metal flashings, including copings, counter-flashings, rooftop units, curbs, caps, expansion joints, etc. Repair or replace caulking as needed.

Roof Specific Leak Investigation

On metal decks, it's crucial to identify the orientation of deck flutes and deck slope. Water may seep through the roofing system, travel within the lower flutes of the deck, and cause leaks inside the building, particularly in lower areas.

For concrete decks or projects where existing roofing material remains, leaks might stem from moisture trapped in the original installation.

In roofing assemblies with poor insulation, leaks can result from condensation. Therefore, pinpointing the exact location and frequency of the leak is vital. Efforts should be made to seal any sources of air leakage.

1. Initiate leak investigations with a comprehensive visual inspection of the roof area corresponding to where leaks have been reported inside.
2. Examine key details such as drains, vents, scuppers, HVAC and other roof-mounted equipment, parapets, areas of ponding water, etc. In dry conditions, locations of water pooling can often be identified by residues on the roof membrane.
3. Investigate lower roof areas for moisture beneath the coating system (soft insulation can sometimes be felt when walking over these areas).
4. Inspect mechanical rooftop equipment, drains, skylights, roof hatches, expansion joints, pipes, vents, etc., for any cuts or punctures in the coating membrane.
5. Check metal flashings (edging, coping, expansion joint covers, parapet caps, etc.) for cracks and poorly sealed joints.
6. If the source of the leak isn't visually apparent, wet the system in the suspected leak area and monitor the interior for leaks.
7. An inspection of the deck underside often reveals signs of water leakage and/or air infiltration.

Emergency Repairs

NanoTech Materials must be informed of any leaks within 30 days from their discovery. The Building Owner may undertake temporary repairs in an emergency to minimize damage to the building or contents. Such repairs should be executed by qualified personnel and won't affect any existing guarantees or warranties, provided they are reasonable, customary, and do not permanently damage the NanoTech roofing materials. Permanent repairs should be completed by an approved NanoTech contractor, under NanoTech's guidance for covered leaks, or as directed by the building owner for non-covered leaks.

Repairs shall be achieved using NanoTech Materials Rain Safe Leak Repair. Before and after digital photography shall be conducted in order to maintain the warranty.

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Temporary Dry Surface Emergency Repairs

- Clean the damaged area using a pressure washer (1,200 to 1,500 psi)
- Rinse with clean water and allow the roof to fully dry.
- Apply NanoTech Materials Rain Safe Leak Repair and Premium Fabric. Contact NanoTech Technical Support Services before using any other product to confirm compatibility.

Specific Repairs for Liquid-Applied Coating Systems Not Over Spray Polyurethane Foam (SPF) Insulation

- Rectify minor mechanical damage to the liquid-applied coating membrane by employing NanoTech Materials Roof Sealant or Rain Safe Leak Repair, followed by applying the NanoTech Cool Roof Coat product as a top-coat. Ensure thorough removal of the damaged membrane before proceeding with repairs. In cases where the repaired area exceeds 2" (51 mm) in diameter, seek guidance from NanoTech Technical Support Services for appropriate repair procedures.

Roof Modifications

NanoTech Materials must be informed of any planned alterations to the roof before execution. The coverage provided by the guarantee or warranty may be jeopardized if:

- NanoTech is not notified of the alterations.
- The required work is not carried out by the original contractor of record (or another NanoTech-certified contractor).
- Non-NanoTech materials are utilized.
- All alterations, including but not limited to modifications involving roof-top HVAC units, other equipment, pipes, satellite dishes, antennas, conduit, general penetrations, skylights, etc., must be pre- approved.

NOTE: These maintenance and inspection procedures are provided for reference purposes only. An approved NanoTech-certified contractor or professional roof consultant may offer a more detailed maintenance program. Maintain records of roof damage and maintenance inspections for each building roof.

13.0 Application Equipment

The following equipment has been rigorously tested with NanoTech's Cool Roof Coating system to ensure optimal application and performance. For best results, we recommend using these tools and systems, which have been evaluated for compatibility and efficiency with our advanced coating technology.

For Use in Application

Roof Coating Sprayers

To achieve consistent and efficient application of NanoTech's Cool Roof Coating, a gas or hydraulic sprayer with a minimum intake of 2.5 GPM and operating pressure of at least 2500 PSI is required, ensuring proper material flow and surface coverage.

- Graco Gas/Hydraulic Sprayers
 - [GH Big Rig](#)
 - [King](#)
 - [DutyMax HD](#)
 - [GMAX II Roof Rig](#)
 - [DutyMax](#)

Spray Tips

For optimal performance with NanoTech's Cool Roof Coating, we recommend using a spray tip designed for a wide fan pattern and equipped with a reversible feature to ensure consistent coverage and quick clog clearing during application..

- [Graco RAC X Wide RAC SwitchTip, 1235](#)

Support For Proper Application

- Nap rollers
- Tie offs
- Gloves
- Eye protection/hard hats
- Mil Gauges
- Cleaners
- Primers
- Fabrics
- Sealant
- Flashing
- Mastic
- Emulsions
- Pond fillers

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14.0 Appendix

14.1 Cool Roof Coat Coverage Rates

NanoTech Materials Cool Roof Coat

NanoTech Cool Roof Coat redefines building heat-rejection by adding unusually low conductivity to high emissivity and reflectivity to keep rooftop heat out, even as soiling and latent heat transfer undermine conventional cool roof systems.

10 Year System Warranty	Dry Mil Min	Gallons per 100ft ²	Wet Mil Nano Topcoat (Cool Roof Coat)	Number of Coats
Metal	20	2.5	28	1
Mod Bit	20	2.5	28	1
EPDM	20	2.5	28	1
PVC	20	2.5	28	1
TPO	20	2.5	28	1
SPF	20	2.5	28	1
Plywood/OSB	20	2.5	28	1
SPF Recoat	20	2.5	28	1
Structural Concrete	20	2.5	28	1
Coating Recoat	20	2.5	28	1
BUR	Contact your Regional Sales Manager			

Warranty Available	
Length	10 years
Type	NDL
Cost	\$4/Square

15 Year System Warranty	Dry Mil Min	Gallons per 100ft ²	Wet Mil Nano Topcoat (Cool Roof Coat)	Number of Coats
Metal	40	5	28	2
Mod Bit	40	5	28	2
EPDM	40	5	28	2
PVC	40	5	28	2
TPO	40	5	28	2
SPF	40	5	28	2
Plywood/OSB	40	5	28	2
SPF Recoat	40	5	28	2
Structural Concrete	40	5	28	2
Coating Recoat	40	5	28	2
BUR	Contact your Regional Sales Manager			

Warranty Available	
Length	15 years
Type	NDL
Cost	\$6/Square

20 Year System Warranty	Dry Mil Min	Gallons per 100ft ²	Wet Mil Nano Topcoat (Cool Roof Coat)	Number of Coats
Metal	40	5	28	2
Mod Bit	40	5	28	2
EPDM	40	5	28	2
PVC	40	5	28	2
TPO	40	5	28	2
SPF	40	5	28	2
Plywood/OSB	40	5	28	2
SPF Recoat	40	5	28	2
Structural Concrete	40	5	28	2
Coating Recoat	40	5	28	2
BUR	Contact your Regional Sales Manager			

Warranty Available	
Length	20 years
Type	NDL
Cost	\$8/Square

14.2 Ancillary System Coverage Rates

Product Name:	Purpose:	Coverage Rate:	Application:	Packaging:
NanoTech Cool Roof Base Coat	Protective Barrier/ Bleed Blocker	2 gallons per 100 square feet	Brushing, Rolling, or Spraying	5-Gal Bucket 55-Gal Drum
NanoTech TriSeam	Seals Penetrations and Seams	2 gallons per 100 linear Feet <i>* Vertical Seams: approx. 1"</i> <i>*Horizontal Seams: approx. 6"</i>	Brushing, Rolling, or Spraying	5-Gal Buckets
NanoTech Rain Safe Leak Repair	Waterproofing Solution that cures under water	2 Coats of 20 wet mils over each capsheet	Brushing or Rolling	3.5-Gal Bucket
NanoTech Roof Cleaner	Enhances Roof Surface Preparation for Coating	300-500 square feet per gallon	Spraying	5-Gal Bucket
NanoTech Roof Sealant <i>*Acrylic Systems</i>	Bridges Large Gaps	Vertical seams: 1/10 gallon per 100 square feet Horizontal seams: ¼ to ½ gal of caulk per 100 square feet	Brushing or Trowel	5-Gal Bucket
NanoTech Roof Sealant <i>*Silicone Systems</i>	Protective Coat for variety of roof membranes	48 wet mils (3 gal per square)	Brushing	5-Gal Bucket <i>*Offered in Black, Grey, or White</i>
NanoTech Rust Inhibiting Primer	Corrosion – Resistant base for Topcoats	120-160 square foot per gallon	Brushing, Rolling, or Spraying	5-Gal Bucket
NanoTech Skylight Sealer	Transparent Coating and Sealer	350-400 square ft per gallon <i>*Depending on substrate</i>	Brushing or Spraying	5-Gal Bucket
NanoTech Sub Slope Silicone	Protective, High Solid, Single Component Coating	14 dry mils /1 gallon per 100 square feet	Brushing, Rolling, or Spraying	5-Gal Bucket 55 Gall Drum <i>*Offered in Black, Grey, or White</i>
NanoTech TPO Primer	Single – Ply Primer	300-400 square feet per gallon	Spraying preferred	5-Gal Bucket 55 Gall Drum

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Our Mission

NanoTech Materials is the global name for **heat control in the built environment, logistics, and industrial sectors.**

Our environmentally adaptive materials play across the heat mitigation spectrum from extreme fire and refractory applications to passive solar radiation protection.



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