

Adsil MicroGuard1™ Advanced Siloxane Technology HVAC/R - PROTECTIVE TREATMENT SYSTEM SPECIFICATION DOCUMENT NUMBER MG1185-01 SECTION 09800 - SPECIAL PROTECTIVE TREATMENT

PART 1. GENERAL

1.01 General requirements of the Project Manual shall apply to all work specified in this section.

1.02 Quality Assurance

- A. Installer (shall be proficient in HVAC/R protective treatment systems)
 - 1. Installer shall be trained & certified, by Adsil, or its' appointed agents, using the written training regimen and these specification protocols from the manufacturer, for HVAC/R system protective treatments.
 - 2. Installer shall certify that all technicians utilized for work in this section are –
 - a. trained and certified journeymen in Adsil MicroGuard1™ HVAC/R protective treatment systems.
 - b. shall have demonstrated a proficiency, in this area, by citing past projects.
 - 3. Installer shall ensure that any specialized equipment, as required by the manufacturer, will be used for work in this section.

1.03 Submittals

- A. Product Data: Submit manufacturer's technical information, including product Technical Data Sheets, Safety Data Sheets, detailing job site and personal safety instructions, product preparation instructions and application instructions for each material specified. Identify by manufacturer's catalog number and general classification.
 - 1. Technical Data Sheet TS-45; MicroKleen™ Industrial Cleaner & Degreaser PLC-1
 - 2. Technical Data Sheet TS-54; MicroKleen™ Acid Cleaner/Neutralizer PLC-AN
 - 3. Technical Data Sheet TS-48; MicroKleen™ Final Rinse AD72-930
 - 4. Technical Data Sheet TS-44; MicroKleen™ Equipment Cleaner AD1-919
 - 5. Technical Data Sheet TS-18; MicroGuard1™ HVAC/R Protective Treatment MG1-3500.
- B. Third Party Data: Submit any relevant case history studies, performed to specification, relative to energy conservation and corrosion protection, when using MicroGuard1™ treatment systems on new and/or in use field HVAC/R units.

1.04 Delivery and Storage

- A. Deliver materials in sealed containers with manufacturer's labels intact.
- B. Store materials in a protected area at a temperature range between 50° F. and 85° F.

1.05 Job Conditions

- A. Apply protective treatment to aluminum fins, coils, tubing, fans, blowers, or cabinets only under the following prevailing conditions:
 - 1. Air, surface, and material temperatures are not below 60° F. or above 95° F.
 - 2. Prevent wide temperature variations, which might result in condensation forming on the freshly treated surfaces or could affect hydrolyzing or curing of the treatment.
 - 3. Avoid product application when rain, heavy dew or fog conditions are imminent or could occur within 2 hours of treatment installation.
- B. Mask or drop cloth surfaces not to be protective treated.
- C. Protect all electronic parts and relays during cleaning and product installation.

- D. Gently broom clean or vacuum coils and immediate work area free from dust, dirt, cobwebs, leaves, debris, etc.
- E. Straighten any bent or folded fins, where needed, using a “fin comb” or like device.

PART 2. PRODUCTS

2.01 Manufacturers

- A. Products of Adsil, Inc., Daytona Beach, Florida 32117 USA. (Phone: 386-274-1382)

2.02 Materials

- A. Cleaners and Conditioners
 - 1. Adsil MicroKleen™ PLC-1 Industrial Cleaner & Degreaser
 - 2. Adsil MicroKleen™ PLC-AN Acid Cleaner/Neutralizer
 - 3. Adsil MicroKleen™ AD72-930 Final Rinse
 - 4. Adsil MicroKleen™ AD1-919 Spray & Equipment Cleaner
- B. Protective HVAC/R Surface Treatment
 - 1. Adsil MicroGuard1™ 3500 (MG1-3500) HVAC/R Protective Treatment

2.03 Product Requirements

- A. Cleaners
 - 1. Cleaners shall be free from any known carcinogen or teratogen materials.
 - 2. Cleaners shall be phosphorous free.
- B. Surface Conditioners & Pre-Treatments
 - 1. Conditioners shall be free from any known teratogens, mutagens, sensitizers or reproductive system toxins.
 - 2. Conditioners & Pre-Treatments shall leave no chemical residues, on the surfaces to be protective treated, which could act as a bond breaker.
- C. HVAC/R Protective Surface Treatments
 - 1. Surface Treatment shall be ambient air temperature cured, inorganic film structures.
 - 2. Surface Treatment shall not act as a significant insulator barrier to the substrate, which would inhibit or degrade heat transfer coefficients.
 - 3. Surface Treatment shall adhere to substrates by direct atom-to-atom covalent bonding, as well as London Force method.
 - 4. Surface Treatment shall produce a nominal dry film thickness of 8 microns.
 - 5. Surface Treatment shall have passed ASTM G-21 with a zero (0) microbial spore growth development rating. The standard ASTM G-21 test must have been conducted by an accredited, third party, independent laboratory.
 - 6. Surface Treatment shall meet or exceed 20,300 hours of corrosion protection using ASTM B117 testing protocols.
 - 7. Surface Treatment shall have scored an 8.0, or above, on the ISO 16773-3 EIS Ionic Barrier Resistance Test.

2.04 Material Preparation

- A. Simply rotate the bottle gently for 60 seconds prior to opening.
- B. Thinning: is generally not required or desirable for the MicroGuard1™ 3500 (MG1-3500) HVAC/R Protective Treatment.

PART 3. EXECUTION

3.01 Pre-work Inspection

- A. Examine HVAC/R Unit to be treated and report any conditions that would adversely affect the appearance or performance of the protective treatment system and which cannot be put into an acceptable condition by specified surface preparation methods.

- B. Do not proceed with opening or application of the specified protective treatment until the HVAC/R Unit can be placed in an acceptable condition.

3.02 Equipment Requirements

- A. Spray Equipment
 - 1. Air compressor, which can deliver 3 CFM of air @ 90 PSI.
 - 2. Adsil AS1-3 Dual Regulated Stainless Steel Pressure Pot (2 gallon pot)
 - 3. Seals and Hoses are to be constructed of EPDM material.
 - 4. Adsil Dual feed precision spray guns with straight tip and 90° tip.
 - 5. Chemical resistant hoses with quick connect couplers
 - 6. Adsil AS1-4 Pump System and Application Wand for cleaning and pre-treatments
 - 7. Hot Water Pressure Cleaner (Optional)
 - 8. Containment and Reclaim Vacuum System – (cleaner solution if required)
- B. Assorted tools, extension cords, lock out – tag out, water hose & nozzle, broom, ladders, buckets, clean rags, fin comb, tarps, etc.

3.03 Surface Preparation

- A. General Preparation
 - 1. Prior to all surface preparation and application operations, completely mask, remove or otherwise adequately protect all non-hermetically sealed electronic parts, such as relays.
 - 2. Disassemble major accesses to the equipment and for field coating, remove access doors and fan screens, in accordance with professional industry standards.
 - 3. For field units, eliminate power to the HVAC/R Unit, at the circuit box. Use tag out/lock out procedures.
 - 4. Gently broom clean or vacuum areas free from dust, dirt, cobwebs, leaves, cotton wood or maple tree seeds, debris, etc.
 - 5. Straighten any bent or folded fins, where needed, using a “fin comb”.
 - 6. Place drop cloths, tarps, plastic sheathing or other protection over any concrete slabs, plants, bushes, or grass areas that should be protected from the cleaning, pre-treating and protective treatment application.
- B. Specific Cleaning
 - 1. Set up containment and reclamation system. In many jurisdictions, the use and collection of cleaning materials may be regulated. It is the responsibility of the installer to be aware of any such regulations and to take appropriate steps to collect and dispose of cleaning materials, in accordance with any such regulations.
 - a. The installer must control the cleaning material waste stream.
 - b. The installer must provide a means of containment of material and collection of material for proper disposal, according to regulation.
 - 2. Using the specified Adsil Pump & Wand System detailed in Section 3.02, liberally flush the condenser and evaporator coils, tubes, fins, fans and cabinet with Adsil MicroKleen™ Industrial Cleaner & Degreaser PLC-1. Apply the PLC-1 Cleaner after reduction with clean, hot water at a 1:1 ratio. Avoid contact with non-hermetically sealed electronic parts, such as relays. Allow the PLC-1 Cleaner to soak on the surface for approximately 5 minutes, but do not allow the cleaning solution to dry. If drying in an area occurs, lightly refresh that area with more PLC-1 Cleaner, lightly misting onto the surface.
 - 3. After the PLC-1 Cleaner has “worked” on the surface for 5 minutes, rinse the surface with clean tap water. Repeat the cleaning process. Using the pressure washer, thoroughly rinse the surface. Rinse well past the phase when visual signs of “suds” have disappeared. Rinse from the top and from all sides of the coils, cabinet, fan and structural surfaces.
 - 4. Copper header returns that exhibit the presence of cuprous oxide (dull brown) or copper sulfate (green patina) may need to be treated with MicroKleen™ PLC-AN Acid Cleaner/Neutralizer, per label instructions, until the copper is restored to its original condition. Use caution to keep acid off adjacent areas. Rinse with clean water.

5. In many instances, the HVAC/R Unit to be protective treated may be degraded or may be located in a coastal or arid environment. Multiple cleanings may be required in order to remove all surface contaminates. Continue the cleaning process, as specified above, until the surface is clean and free from all contaminates.
- C. Specific Final Rinsing
1. Using the specified Adsil AS1-4 Pump & Wand System detailed in Section 3.02, liberally flush the condenser and/or evaporator coils, tubes, fins, fans, blowers, and cabinet with Adsil MicroKleen™ Final Rinse AD72-930. Rinse from the top and from all sides of the coils, cabinet, fan, and structural surfaces. **NOTE:** Make sure that precautions have been taken to totally remove and clean all PLC-1 Cleaner residues from the sprayer before applying MicroKleen™ Final Rinse AD72-930.
 2. Allow the MicroKleen™ Final Rinse AD72-930 to air dry completely on the surface.
 - a. For in field applications, the power may be temporarily turned on and the condenser may be run to help accelerate the drying or the unit may be allowed to air dry.
 - b. For factory or in field applications, a standard electric leaf blower can be used to help accelerate drying.
 - c. Disconnect the power source before proceeding to the application of MicroGuard1™ 3500 (MG1-3500) HVAC/R Protective Treatment.
 - d. Spot check the pH of surfaces to be protective treated (using standard pH paper) to determine that the pH is between 6 acidic and 8 basic. If the pH does not fall within this range, continue rinsing with clean tap water.

3.04 Product Readiness

- A. Adsil MicroGuard1™ 3500 (MG1-3500) HVAC/R Protective Treatment
1. Always set the product aside in a protected area, away from heat sources or direct sunlight.
 2. Shake bottle, gently, for 1 minute prior to opening.

3.05 Application of Protective Treatments

- A. All materials shall be applied under adequate illumination, evenly distributed, and properly applied.
- B. All materials shall be applied in a continuous film, free from skips, holidays or pinholes.
1. Pour the MicroGuard1™ 3500 (MG1-3500) HVAC/R Protective Treatment into the AS1-3 HVAC spray system pressure pot reservoir (see Section 3.02). It is best to dedicate a spray system just for applying the treatment. If this is not possible, flush the spray system with liberal amounts of MicroKleen™ Equipment Cleaner AD1-919, before proceeding with the application of MicroGuard1™ 3500 (MG1-3500) Protective Treatment.
 2. Spray the MicroGuard1™ 3500 (MG1-3500) HVAC/R Protective Treatment onto and into all areas to be protective treated. Start with a pot pressure of 10 psi and fluid pressure of 40 psi. Adjust as needed until full penetration is achieved. Completely saturate the surfaces, allowing the treatment to flow over and migrate down and into all recess areas. It is important to achieve complete wetting of all surface areas to be protected. Take care to minimize skips or holidays. MG1-3500 will naturally attract to bare non-ferrous metals, which is very important, when treating the condenser and/or evaporator coil areas. Apply the MG1-3500 from the top, front, and back areas of the fin/coil assemblies. Spray the copper header returns from numerous angles to ensure complete and uniform coverage.
 3. When treating the cabinet enclosure (interior or exterior), spray (with HVLP sprayer – not pressure pot system) or hand apply MG1-3500 onto the surface in a thin, even film. Avoid sags or runs.
 4. Estimated products yield, per tonnage.
 - a. Product yield for residential HVAC/R Unit (up to 5 tons) – 1 quart of MG1-3500 will treat approximately 4 tons of capacity.
 - b. Product yield for light commercial HVAC/R Unit (6-25 tons) – 1 quart of MG1-3500 treat approximately 5 - 6 tons of capacity.
 - c. Product yield for commercial HVAC/R Unit (26-100 tons) – 1 quart of

MG1-3500 will treat approximately 6+ tons of capacity.

3.06 Clean Up

- A. Thorough cleaning of the spray equipment is essential to ensure its continued operational efficiency.
 - 1. Purge all remaining MicroGuard1™ 3500 (MG1-3500) HVAC/R Protective Treatment from the pressure pot and fluid hose back into original container. Pour at least one (1) pint of MicroKleen™ Equipment Cleaner AD1-919 into the pot reservoir. Make sure that all interior surfaces of the pot reservoir have been cleaned free from the treatment residue.
 - 2. Next, pressurize the pot reservoir to about 20 psi and spray/flush the Equipment Cleaner through the gun, wand, and nozzle, until the entire quart of Equipment Cleaner has been evacuated into a collecting bucket.
 - 3. Spray/flush one (1) more pint of fresh MicroKleen™ Equipment Cleaner AD1-919 through the gun, wand, and nozzle. This will remove all latent residues from the fluid hose and gun assembly.
 - 4. Remove the nozzle/tip from the gun/wand assembly and immerse into the MicroKleen™ Equipment Cleaner AD1-919. Clean the nozzle thoroughly to prevent future clogging. Dispose of cleaning material according to current local regulations.
- B. Any drips, spills or over spray, of the Protective Treatment, can be cleaned using a cotton cloth saturated with MicroKleen™ Equipment Cleaner AD1-919. Remove drips, spills or over spray before the Protective Treatment dries to touch. Dispose of saturated cloths in a safe and proper manner.
- C. Re-assemble any parts of the HVAC/R Unit that were dismantled, following the application of the Protective Treatment.
- D. For field applications, remove debris from the job site and leave storage area clean.
- E. Unit can be restarted in 30 minutes.
- F. For field applications, remove the lock out/tag out and re-connect the power to the HVAC/R Unit at the circuit box.

3.07 Inspection

- A. Inspect and repair all work that is not acceptable to the Specifier and request the final acceptance.
- B. Record all information, as required on the Adsil HVAC/R Field Application Data Form.

3.08 Protective Treatment Schedule (HVAC/R parts & components)

- A. As indicated on schedules
 - 1. Aluminum, Fins, Tubes, Fans, Blowers
 - a. Apply by spray, one coat of Adsil MicroGuard1™ 3500 (MG1-3500) HVAC/R Protective Treatment onto cleaned and properly prepared surfaces, per specification.
 - 2. Pre-painted Cabinets and Enclosures
 - a. Apply by spray or hand applied one coat of Adsil MicroGuard1™ 3500 (MG1-3500) HVAC/R Protective Treatment onto cleaned and properly prepared surfaces, “pick up” any sags or runs with a foam brush.
 - 3. Place the completed Adsil sticker decal onto the treated unit, recording date of application on the decal.
 - 4. Keep a copy of the HVAC/R Field Application Data Form for your records.

END OF SECTION – 09880

(Revision: 8/25/20)