

Adsil MicroGuard® Advanced Siloxane Technology HVAC/R - PROTECTIVE TREATMENT SYSTEM SPECIFICATION DOCUMENT NUMBER AD1185-02 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 MicroGuard® 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 Sheets, Material Safety Data Sheets, detailing job site and personal safety instructions, product mixing instructions and application instructions for each material specified. Identify by manufacturer's catalog number and general classification.
 - 1. Technical Sheet TS-45; MicroKleen™ Industrial Cleaner & Degreaser PLC-1
 - 2. Technical Sheet TS-54; MicroKleen™ Phosphoric Acid Etch & Clean PLC-35
 - 3. Technical Sheet TS-48; MicroKleen™ Final Rinse AD72-930
 - 4. Technical Sheet TS-44; MicroKleen™ Equipment Cleaner AD1-919
 - 5. Technical Sheet TS-16; MicroGuard® HVAC/R Coil & Fin Protective Treatment AD35
 - 6. Technical Sheet TS-52; MicroGuard® A/G Clear Gloss Treatment AD00
- B. Third Party Data: Submit any relevant case history studies, performed to specification, relative to energy conservation and corrosion protection, when using MicroGuard® 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 or copper fins, coils, tubing, fans, blowers or cabinets only under the following prevailing conditions:
 - 1. Air, surface and material temperatures are not below 55° 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 mixing or 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-35 Phosphoric Acid Etch & Clean
 - 3. Adsil MicroKleen™ AD72-930 Final Rinse
 - 4. Adsil MicroKleen™ AD1-919 Spray & Equipment Cleaner
- B. Protective HVAC/R Surface Treatments
 - 1. Adsil MicroGuard® HVAC/R Coil & Fin Protective Treatment AD35
 - 2. Adsil MicroGuard® A/G Clear Gloss Treatment AD00

2.03 Product Requirements

- A. Cleaners
 - 1. Cleaners shall be free from any known carcinogen or teratogen materials.
- 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 an insulating barrier to the substrate, which would inhibit or degrade heat transfer coefficients or increase energy consumption of the condenser.
 - 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 dry film thickness no greater than 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 6,000 hours of corrosion protection using ASTM B117 testing protocols.

2.04 Material Preparation

- A. Catalyze and/or mix materials strictly in accordance to manufacturer's most current published technical literature.
- B. Thinning: is generally not required or desirable for the MicroGuard® HVAC/R Coil & Fin Clear Protective Treatment AD35.

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 the mixing 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 Dual Regulated Stainless Steel Pressure Pot (2 gallon pot)
 - 3. Adsil Dual feed precision spray guns with straight tip
 - 4. Chemical resistant hoses with quick connect couplers
 - 5. Regulator assemblies & safety valves
 - 6. Adsil Pump System and Application Wand for cleaning and pre-treatments
 - 7. Hot Water Pressure Cleaner
 - 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 other wise 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-35 Acid Etch & Clean, 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 contaminants. Continue the cleaning process, as specified above, until the surface is clean and free from all contaminants.

C. Specific Final Rinsing

1. Using the specified Adsil 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 MicroGuard® HVAC/R Treatment AD35.
 - 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 if surface reads acidic and MicroKleen™ AD72-930 if surface is basic.

3.04 Mixing and Catalyzing

- A. Adsil MicroGuard® HVAC/R Treatment AD35 (Smaller Batch Size Needs – 1 quart)
 1. MicroGuard® HVAC/R Treatment AD35 is a three-component material, which must be properly mixed before use. This product is packaged, in kit form, as an “**A**” component a “**B**” component and a “**C**” component. For proper mixing, add the “**B**” component into the short filled container of “**A**” component. Lightly secure the cap. Using a standard lab magnetic mixture, drop the mixing peanut into the mixture and with a moderate vortex, blend for **15** minutes. You will notice a gradual warming of the product as the components are mixed. This warming is a normal exothermic reaction.
 2. Next, add the “**C**” component into the admixture of the “**A**” and “**B**” components. Secure the cap and continue mixing for **15** more minutes. Finally, set the mixture aside for **30** minutes, in order to facilitate proper chemical induction (“sweat in”).
 3. Always set the product aside in a protected area, away from heat sources or direct sunlight, during its 30 minute induction period.
 - a. The 30 minute induction time is sufficient when the air temperature is 70° F. to 90° F. When the air temperature is 55° to 69°, allow 45 minutes for induction. Below 50° F., **DO NOT MIX OR APPLY TREATMENT.**
 4. For good workman like time management, it is a good idea to mix the product in order to correspond with the completion of surface preparation methods, as described above.
 5. The useable pot life of mixed product is up to **6** hours.
- B. Adsil MicroGuard® HVAC/R Protective Treatment AD35 (up to 4 gallon kits per batch)
 1. When mixing MicroGuard® HVAC/R Treatment AD35, it will be more efficient to mix the material in a larger white or clear, HDPE 5 gallon bucket. The bucket must be clean to avoid cross-contamination.
 - a. Pour the “**A**” and “**B**” components into a 5 gallon white or clear, clean HDPE plastic bucket, only.
 - b. Using the Adsil Product mixer with timer, blend the components together for **15** minutes. Cover the bucket with a ‘V’ notch/cut lid during mixing.

You will notice a moderate exothermic heat reaction during mixing. This is normal.

- c. Next, pour the “C” component into the admixture of the “A” and “B” components. Blend for **15** additional minutes. Place a lid over the bucket and allow the mixed material to chemically induct (“sweat in”) for **30** minutes.
2. Always set the product aside in a protected area, away from heat sources or direct sunlight, during its 30 minute induction period.
 - a. The 30 minute induction time is sufficient when the air temperature is 70° F. to 90° F. When the air temperature is between 55° F. and 69° F., allow 45 minutes induction. Below 50° F., **DO NOT MIX OR APPLY TREATMENT.**
3. For good workman like time management, it is a good idea to mix the product in order to correspond with the completion of surface preparation methods.
4. Apply the properly mixed and inducted product within **6** hours.

3.05 Application of Protective Treatments

- A. Strictly follow Adsil’s recommendations and instructions regarding product material and mixing so as to provide the best quality work.
- B. All materials shall be applied under adequate illumination, evenly distributed and properly applied.
- C. All materials shall be applied in a continuous film, free from skips, holidays or pinholes.
 1. Pour the properly catalyzed MicroGuard® AD35 Protective Treatment into the spray system pressure pot reservoir (see Section 3.02). It is best to dedicate a spray system just for applying the catalyzed 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 MicroGuard® Protective Treatment AD35.
 2. Spray the MicroGuard® 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. MicroGuard® AD35 will naturally attract to bare metal, which is very important, when treating the condenser and/or evaporator coil areas. Apply the MicroGuard® Treatment 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 MicroGuard® AD00 Clear Treatment 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 MicroGuard® Treatment will treat approximately 4 tons of capacity.
 - b. Product yield for light commercial HVAC/R Unit (6-25 tons) – 1 quart of MicroGuard® Treatment will treat approximately 5 - 6 tons of capacity.
 - c. Product yield for commercial HVAC/R Unit (26-100 tons) – 1 quart of MicroGuard® Treatment 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 MicroGuard® AD35 Treatment from the pressure pot and fluid hose. 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 10 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. Allow a minimum of 2 hours dry time before re-powering the HVAC/R Unit.
 - 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 and/or Copper Coils, Fins, Tubes, Fans, Blowers
 - a. Apply by spray one coat of Adsil HVAC/R MicroGuard® AD35 Clear Treatment onto cleaned and properly prepared surfaces, per specification.
 2. Pre-painted Cabinets and Enclosures
 - a. Apply by spray one coat of Adsil MicroGuard® AD00 Clear Gloss 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: 09/10)