

Acrylic ESD Coating—Aerosol

Description

844AR is a one-part, solvent-based, permanent static dissipative coating for protecting sensitive electronic components from static charges. It forms a translucent coating, and provides excellent adhesion to plastics, paints, metals, and many other surfaces. The coating can be cured at room temperature or higher. The cured coating is flexible, durable, and will not crack, chip or peel.

Application and Uses

In the electronics industry, electrostatic discharges (ESD) as small as 100 V can damage components. Adding a film of electro-dissipative material such as 844AR helps prevent static charge accumulation.

844AR is commonly used to coat interior areas. Applications include:

- *Electronic enclosures*
- *Computer rooms*
- *Server casings*
- *Robotic components*
- *Explosion hazard areas*
- *Cabinets*
- *Clean rooms*
- *Shelving*
- *Aircraft hangars*

Features and Benefits

- *Permanent and translucent*
- *Packaged in a convenient aerosol format*
- *Surface resistance of $1.5 \times 10^9 \Omega/\text{sq}$*
- *Flexible, smooth, durable, and abrasion resistant*
- *Does not contain toluene, xylene or MEK*
- *Quick dry*
- *Superior adhesion*
- *Does not deplete ozone*
- *Low VOC and HAP free*

Usage Parameters

| Properties | Value |
|---|--|
| Dry/recoat time | 5 min |
| Full cure@22 °C [72 °F] | 24 h |
| Full cure@65 °C [149 °F] | 30 min |
| Theoretical 340G spray can coverage ^{a)} | ≤1 000 cm ² [≤150 in ²] |

a) Estimate based on a coat thickness of 50 µm [2.0 mil] and 50% transfer efficiency.

Temperature Ranges

| Properties | Value |
|---|-------------------------------|
| Constant service temperature | -40 to 120 °C [-40 to 248 °F] |
| Intermittent temperature limit | -50 to 125 °C [-58 to 257 °F] |
| Storage temperature limit ^{b)} | -5 to 40 °C [23 to 104 °F] |

b) The product must stay within the storage temperature limits stated. Aerosol container will be crushed at ≤-26.5 °C [≤15.7 °F].

Cured Properties

| Electrical & Magnetic Properties | Method | Value | |
|---|--|--|---|
| Surface resistance ^{a)} 1 coat @0.3 mil 2 coats @0.7 mil 3 coats @0.9 mil | square probe square probe square probe | Resistance $1.5 \times 10^9 \Omega/\text{sq}$ $5.5 \times 10^8 \Omega/\text{sq}$ $2.2 \times 10^9 \Omega/\text{sq}$ | Conductance $6.6 \times 10^{-10} \text{ S}$ $1.8 \times 10^{-9} \text{ S}$ $6.6 \times 10^{-10} \text{ S}$ |
| Magnetic class | — | Diamagnetic (non-magnetic) | |
| Relative permeability | — | <1.0 | |

a) Surface resistance is given in Ω/sq and the corresponding conductance in Siemens (S or Ω^{-1}).

| Physical Properties | Method | Value |
|---------------------|--------|-------------------------|
| Paint type | — | Lacquer (thermoplastic) |
| Color | Visual | Semi-translucent white |
| Abrasion resistant | — | Yes |
| Blister resistant | — | Yes |
| Peeling resistant | — | Yes |
| Water resistant | — | Yes |

Cured Properties

| Mechanical Properties | Method | Value |
|-----------------------|-------------|---------|
| Adhesion (ABS) | ASTM D 3359 | 5B |
| (PC) | ASTM D 3359 | 5B |
| (PVC) | ASTM D 3359 | 5B |
| (Polyamide) | ASTM D 3359 | 5B |
| (Aluminum) | ASTM D 3359 | 5B |
| (Copper) | ASTM D 3359 | 5B |
| (Brass) | ASTM D 3359 | 5B |
| (Stainless Steel) | ASTM D 3359 | 0B |
| (Glass) | ASTM D 3359 | 0B |
| Pencil hardness (ABS) | ASTM D 3363 | H, hard |

Uncured Properties

| Physical Properties | Mixture |
|--------------------------|-----------------|
| Color | Off-white |
| Density @25 °C [77 °F] | 1.06 g/mL |
| Viscosity @25 °C [77 °F] | TBD |
| Flash Point | -17 °C [1.4 °F] |
| Odor | Sweet |

Compatibility

Chemical resistance—The thermoplastic resin is dissolved by common paint solvents like toluene, xylene, acetone and MEK. This allows for easy repair and rework of the coating, but makes it unsuitable for use in solvent-rich environments.

Adhesion—The coating adheres to most plastics and metals used to house printed circuit assemblies; however, it is not compatible with contaminants like water, oil, or greasy flux residues that may affect adhesion. If contamination is present, first clean the surface to be coated with MG Chemicals 824 Isopropyl alcohol.

Substrate Adhesion

| Substrate | Note |
|---------------------------------------|---|
| Acrylonitrile Butadiene Styrene (ABS) | Chemically etches ^{a)} and adheres well. |
| Polycarbonate (PC) | Chemically etches ^{a)} and adheres well. |
| Polyvinyl Acetate (PVA) | Chemically etches ^{a)} and adheres well. |
| Polyvinyl Chloride (PVC) | Chemically etches ^{a)} and adheres well. |
| Polyamide (Nylon 66) | Chemically etches ^{a)} and adheres well. |
| Acrylics or Acrylic Paints | Adheres well to clean surfaces. |
| Epoxy, FR4 substrate | Adheres well to clean surfaces. |
| Polyurethane | Adheres well to clean surfaces for most urethane types. |
| Wood | Adheres well with surface preparation. |
| Brass | Adheres well with surface preparation. |
| Copper | Adheres well with surface preparation. |
| Aluminum | Adheres well with surface preparation. |

a) Etching is similar to sanding, except that it softens the surface helping the paint adhere to the plastic.

Attention!

Do not use on thin plastics or plastics where you want to keep original surface. The product contains a controlled amount of solvents designed to chemically etch plastic surfaces to help adhesion.

Storage

Store between -5 and 40 °C [23 and 104 °F] in a dry area, away from sunlight. Storing above or below this temperature range will cause the container to rupture or collapse.

Health and Safety

Please see the 844AR-Aerosol Safety Data Sheet (SDS) for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

Aerosol Application Instructions

For best results, and to ensure optimal conductivity, follow the procedure below. Apply thin, wet coats as opposed to thick coats. We recommend a final dry film thickness of at least 1.0 mil [25 µm].

Prerequisites

- Clean and dry the surface of the substrate to remove oil, dust, water, solvents, and other contaminants.

Material & Equipment

- Personal protection equipment (See 844AR-Aerosol SDS).

To apply the coating:

1. Shake the can vigorously for 2 minutes, and swirl the bead around the bottom to lift settled material back into solution.
2. Spray a test pattern. This step ensures good flow quality and helps to avoid runs by establishing an appropriate distance.
3. At a distance of 20 to 25 cm (8 to 10 inches), spray a thin and even coat onto the surface. For best results, and to avoid excess paint buildup in one spot, use spray-and-release strokes with an even motion.
4. Before applying the next coat, rotate the surface 90° or change stroke direction (horizontal or vertical). This will ensure good coverage.
5. Wait one minute, shake the can, and spray on another coat. The delay will help you to avoid trapping solvent between coats.
6. Go to Step 3, and apply additional coats until desired thickness is achieved.
7. Let dry for 5 minutes (flash-off time) at room temperature.

Note: Swirling the aerosol can slightly while you wait prevents settling.

Attention!

- Holding the can at a non-vertical angle during spray application may result in uneven coating.
- Applying too thick a coat can cause runs that will hamper solvent evaporation.
- Spraying onto horizontal surfaces is not recommended.

After use, clear the nozzle of the aerosol:

1. Turn the aerosol can upside down immediately.
2. Press button until clear propellant comes out. The propellant should turn clear in a few seconds.
3. Ensure the face of the button is clean of residue by wiping with a cloth or paper towel.

Attention! Failure to clear nozzle can lead to valve being blocked open or closed in a way that is hard to spot.

- If blocked shut, the can will not be usable.
- If blocked slightly open, the contents can spill out overnight, creating a mess.

Cure Instructions

Room temperature cure:

- Let cure at room temperature for 24 h.

Heat cure:

- Put in oven at 65 °C [149 °F] for 30 min.

Packaging and Support Products

| Cat. No. | Packaging | Net Volume | Net Weight | Packaged Weight |
|------------|-----------|---------------------|-----------------|-----------------|
| 844AR-340G | Aerosol | 373 mL [12.6 fl oz] | 340 g [12.0 oz] | Not available |

Thinners & Conductive Coating Removers

- Thinner: Cat. No. 435-1L, 435-4L
- Thinner 1: Cat. No. 4351-1L, 4351-4L

Technical Support

Please contact us regarding any questions, suggestions for improvements, or problems with this product. Application notes, instructions and FAQs are located at www.mgchemicals.com.

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