CHO-SHIELD® 2056

ELECTRICALLY CONDUCTIVE SILVER-PLATED COPPER ACRYLIC EMI COATING

Customer Value Proposition:

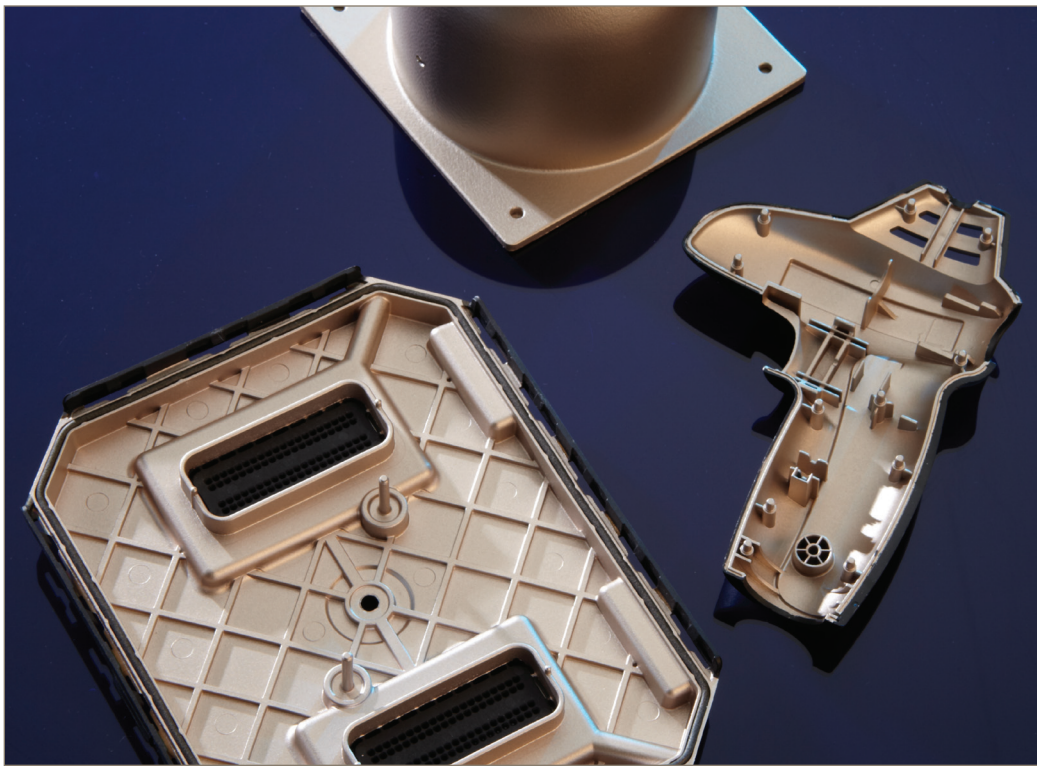
CHO-SHIELD® 2056 is an electrically conductive, one-component silver and silver/copper-filled acrylic coating that is specially formulated for application on plastics to provide high levels of EMI shielding.

CHO-SHIELD 2056 is ideal for use on medical electronic enclosures and assemblies which require high level, reliable EMI shielding performance and may benefit from silvers' antimicrobial properties. The excellent electrical conductivity of the coating allows for thinner applied coatings, saving time and money in processing. Thinner coatings limit material wastage due to overspray and reduce the frequency of mask washing steps.

Meets UL Specification 746-C for adhesion.

CHO-SHIELD 2056 conductive coating is ideal for a variety of applications, including:

- High levels of EMI shielding (see shielding effectiveness curve Fig. 1)
- Anti-static protection
- Surface grounding
- Coating of ABS, PC/ABS, and many other types of plastic enclosures



Features and Benefits:

- One component
- Easy to use. CHO-SHIELD 2056 is ready to use with simple mixing. Can be applied with standard spray paint equipment, no expensive capital equipment required.
- Thermoplastic acrylic
- Material dries at room temperature-no high temperature cure ovens required, fast throughput. Good adhesion to a variety of plastics.
- Silver/copper and silver flake filler
- Excellent conductivity and EMI shielding. Cost-effective solution for electronic enclosures and assemblies which require high level EMI shielding and conductivity.
- Excellent-leveling, Wets and covers surfaces smoothly
- Provides great coverage at thin dry film thickness which minimizes material costs and reduces paint cycle time.

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Parker Chomerics

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Application

Recommended Preparation

1. Clean the substrate:
   The substrate surface should be clean, dry and free of oils, release agents, dirt and lint.
2. Mix the material:
   Mix the material well on a paint shaker (typically 1-minute for one-gallon can). Or, mix by hand with a large spatula until all solids are in a homogeneous suspension. Check that no unmixed material remains on the bottom and the sides of the container.
3. Optional: Strain the material to reduce or eliminate the potential for clogging the spray nozzle. The paint can be strained through a course mesh (1000 micron) flat strainer into a pressure pot for spray. All metal fillers should be transferred, although a small amount of filler clusters might be collected in the strainer.

Optional thinning:

Standard thinning can be accomplished with MEK (methyl ethyl ketone) solvent.

During humid days (relative humidity >50% and temperature >30°C/85°F), use n-Butyl alcohol and add up to 8 fluid ounces per gallon of paint to eliminate blushing (a white tint on the drying surface).

Fluid Delivery System

Use a pressure pot (15 psi, 103 kPa, typical) with large diameter, paddle-type agitator at low mixing speed to keep the metal fillers in uniform suspension.

Conventional spray equipment such as HVLP (High Volume, Low Pressure) or DeVilbiss EGA 503 with propeller agitator pressure pots may be used for spray application with approximately 20-50 psi (138-345 kPa) atomizing air. Use lowest pressure possible.

Re-circulation of the paint from the mixing pot through the spray gun and back via a pump delivery system is recommended for greater filler uniformity.

For large volume applications, a robotic spray system with an HLVP spray gun should be used to minimize material loss due to overspray and maximize paint transfer efficiency. Siphon feed equipment can be used for small or prototype runs.

Spray Gun and Pressure

Use a standard HVLP spray gun with approximately 20-40 psi (138-276 kPa) atomizing air.

A fluid nozzle with a minimum orifice diameter of 0.040 (1.016) is recommended.

To obtain maximum adhesion and conductivity, dry spraying should be avoided. Adjust the spray pressure to achieve a proper wet film when applying the conductive coating.

Nominal Dry Film Thickness

A nominal dry film thickness of 0.001 inches (25 µm, 1 mil) is recommended to obtain > 75 dB shielding effectiveness from 80 MHz to 18 GHz. However, a thinner or thicker coat may be acceptable depending on the shielding requirements of the device being protected.

Allow material to dry 10-20 minutes at room temperature between coats to avoid solvent entrapment.

Drying Conditions

1. Dry at room temperature for 10-20 minutes.
2. Continue drying for 30 minutes at 65°C ± 5.5°C (150°F ± 10°F) for 0.001 inches (25 µm, 1 mil) thickness.

   Dry longer if thicker film, shorter if thinner film, to achieve desired conductivity.

   Note: Drying at room temperature for 24 hours will achieve similar performance.

Clean-up

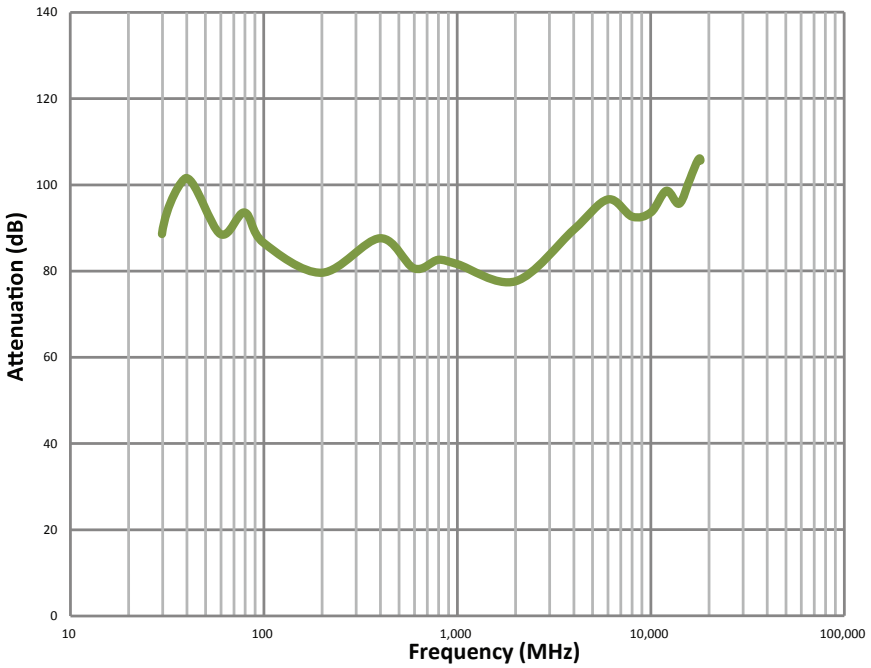
The spray system, including spray gun, mixing pot, and containers can be cleaned with MEK or Acetone (VOC exempt solvent). Masks can be power-washed with Challenge 485S barrier coat.

Storage and Handling

CHO-SHIELD 2056 should be stored at 10°C to 30°C (50°F to 86°F) and has a 12 month shelf life from the date of manufacturing in the original sealed container. CHO-SHIELD 2056 is a flammable liquid. Please consult the material safety data sheet for proper handling procedures before use.

Figure 1

CHO-SHIELD 2056 Typical Shield Effectiveness PER CHO-TM-TP11*



* This test Method is available from Parker Chomerics.

CHO-SHIELD 2056 - Product Information

Table 1 Typical Properties

CHO-SHIELD 2056			
Typical Properties	**Typical Values**	**Test Method**	
Polymer	Acrylic	N/A	
Filler	Silver-Plated Copper and Pure Silver	N/A	
Mix Ratio (A:B by weight)	1-part	N/A	
Color	Copper	N/A	(Q)
Spray Viscosity	14 to 20 seconds	Zahn Cup Number 2	(Q)
Surface Resistance (max.) at 0.001 inches (25 µm, 1 mil)	<= 0.030 ohms / square	CEPS-0002	(Q/C)
Shielding Effectiveness (see Figure 1)	>75 dB	CHO-TM-TP11*	(Q)
Recommended Dry Film Thickness	.001" (25 µm)	N/A	
Wet Density	1.1	ASTM D792	(Q/C)
Average solids (weight)	32%	Calculated	(Q)
Continuous Use Temperature	-40 to 85°C (-40 to 185°F)	N/A	(Q)
Pot Life	Unlimited	N/A	(Q)
Drying Time- Room Temperature Tack Free	0.5 hour @ 21°C (70°F)	N/A	
Drying Time- Room Temperature Full Dry	24 hrs @ 21°C (70°F)	N/A	
Drying Time- Elevated Temperature Full Dry	0.25 hr @ 21°C (70°F), followed by 0.5 hr @ 66°C (150°F)	N/A	
Shelf Life at 21°C (70°F), unopened, from Date of Manufacture	12 months	N/A	(Q)
Calculated VOC	718 g /L	Calculated	
Theoretical coverage at recommended dry film thickness	0.062 ft^2/gram 0.019 m^2/gram 260 ft^2/gallon	N/A	

Notes: N/A – Not Applicable, (Q/C) - Qualification and Conformance Test, (Q) - Qualification Test
* This test Method is available from Parker Chomerics.

Ordering Information

Product	Weight (grams)	Packaging	Chomerics Part No.	Primer Included
CHO-SHIELD 2056	4050	1 gallon aluminum can	52-03-2056-0000	Not Required