CHO-SHIELD® 608

Electrically Conductive Flexible Silver Polyester EMI Coating

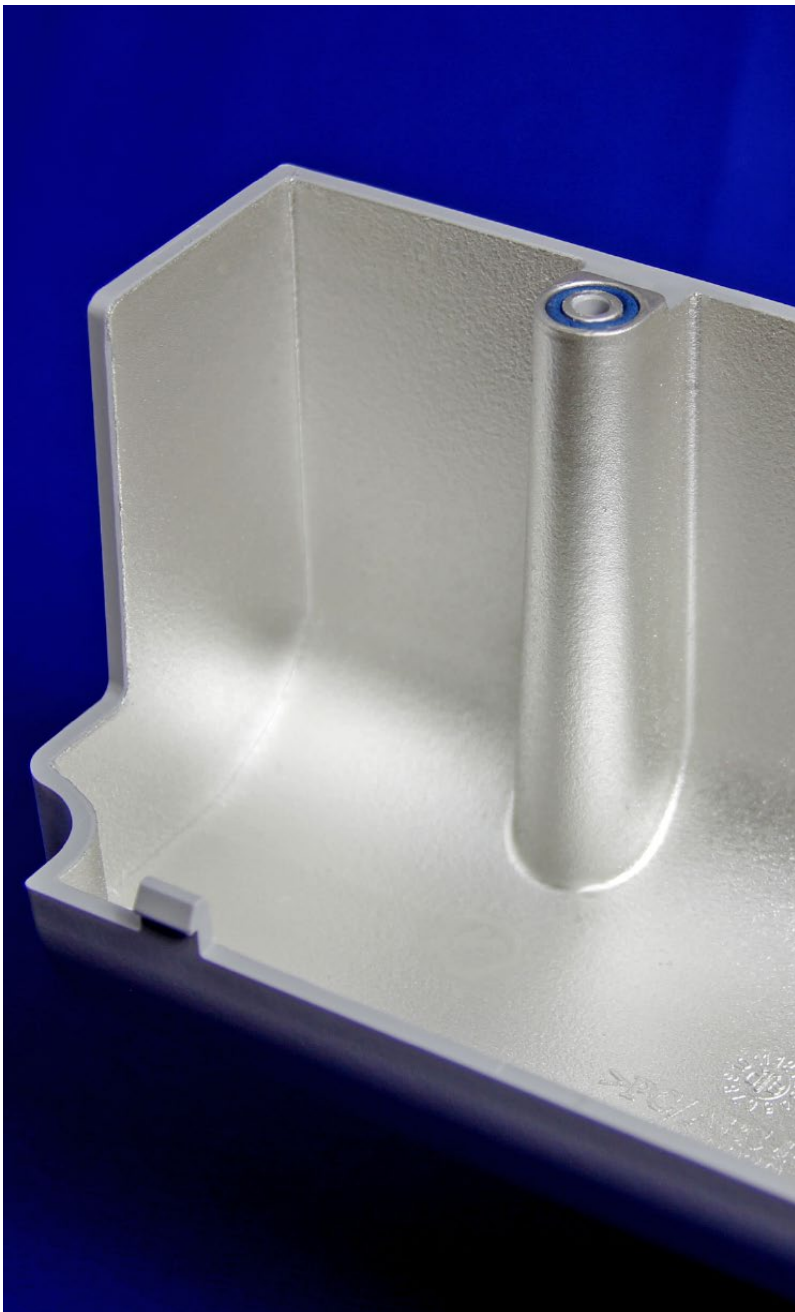
Parker Chomerics CHO-SHIELD 608 is a high performance, silver-filled polyester conductive coating designed to provide premium shielding performance at a reasonable price.

This one component coating is a specially formulated flexible polymer system which "lays down" smoothly when sprayed to provide complete EMI shielding coverage at very thin coating thicknesses. Its flexibility makes it especially attractive for conductive coating of parts with tight geometries.



Product Features

- One component
- Designed for high volume spray application.
- Exceptional working life at room temperature. Cures only when heated, i.e., greater than 74°C (165°F).
- Silver flake filler
- High performance EMI shielding solution for electronic enclosures and assemblies.
- Polyester coating
- Flexible coating which provides great adhesion to a variety of substrates.
- Excellent wettability allows for uniform coating application at thin dry film thicknesses (< 0.001").



Typical Applications

- Consumer electronics
- Circuit boards and semiconductor packages
- Complex plastic parts and enclosures

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CHO-SHIELD® 608 Product Information

Typical Properties	Typical Values	Test Method	
Polymer	Polyester	N/A	
Filler	Silver	N/A	
Mix Ratio (A/B by weight)	1-part	N/A	
Color	Silver	N/A	(Q)
Spray Viscosity	14 to 20 seconds	Zahn Cup Number 2	(Q)
Surface Resistance at 0.001 inches (25 µm, 1 mil)	0.015 ohms / square	CEPS-0002	(Q/C)
Shielding Effectiveness	>80 dB (see graphs below)	CHO-TM-TP11*	(Q)
Recommended Dry Film Thickness	0.0005" (13 µm)	N/A	
Wet Density	1.4	ASTM D792	(Q/C)
Average solids (weight - concentrated as supplied) Thin per application note 2	51%	Calculated	(Q)
Continuous Use Temperature	-40 to 150°C (-40 to 302°F)	N/A	(Q)
Pot Life	Unlimited	N/A	(Q)
Drying Time - Room Temperature Tack Free	None	N/A	
Drying Time - Room Temperature Full Dry**	None	N/A	
Drying Time - Elevated Temperature Full Dry	Cure Cycle Option 1: 0.25 hr @ 21°C (70°F), followed by 0.5 hr @ 121°C (250°F) Cure Cycle Option 2: 0.25 hr @ 21°C (70°F), followed by 1.0 hr @ 74°C (165°F)	N/A	
Calculated VOC	711 g /L	Calculated	
Theoretical Coverage at Recommended Dry Film Thickness	0.050 ft^2/gram 0.0046 m^2/gram 263 ft^2/gallon	N/A	
Shelf Life, unopened, from date of manufacture	9 months	N/A	(Q)
Storage Conditions	70°F/21°C +/- 9°F/5°C	N/A	

Notes: N/A – Not Applicable, (Q/C) - Qualification and Conformance Test, (Q) - Qualification Test, the above properties are based on Cure Cycle 1.
* Parker Chomerics Test Method CHO-TM-TP20 which is based on ASTM D4935 and Parker Chomerics Test Methods CHO-TM-TP07, CHO-TM-TP11, and CHO-TM-TP27 which are based on IEEE Standard 299. All test methods are available upon request from Parker Chomerics.

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CHO-SHIELD® 608 Shielding Effectiveness

Figure 1 - Typical Shielding Effectiveness

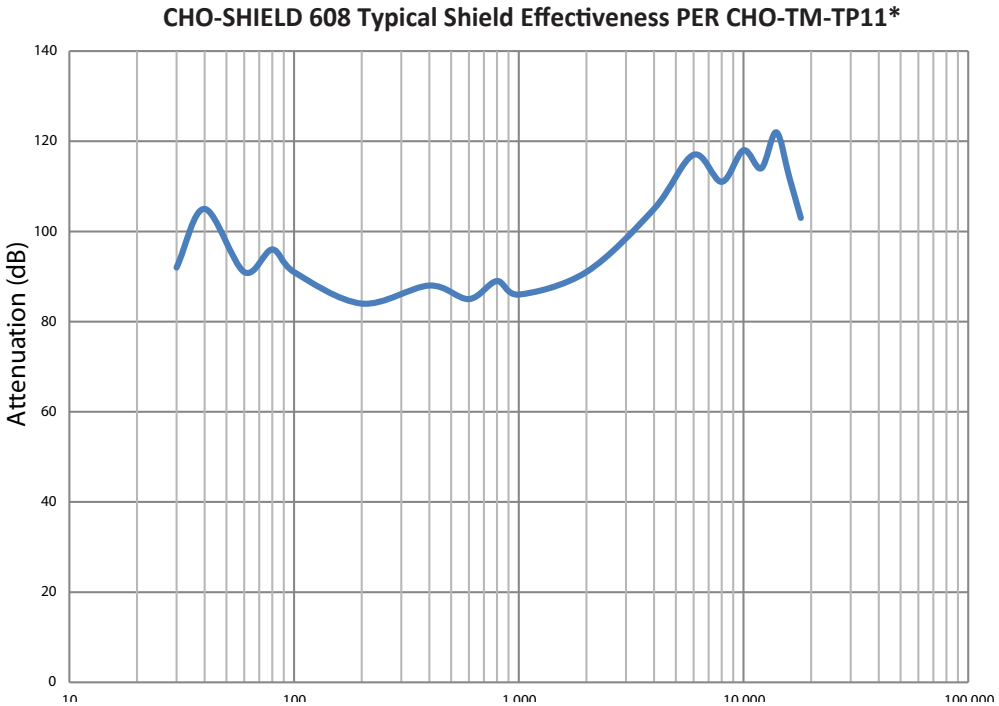
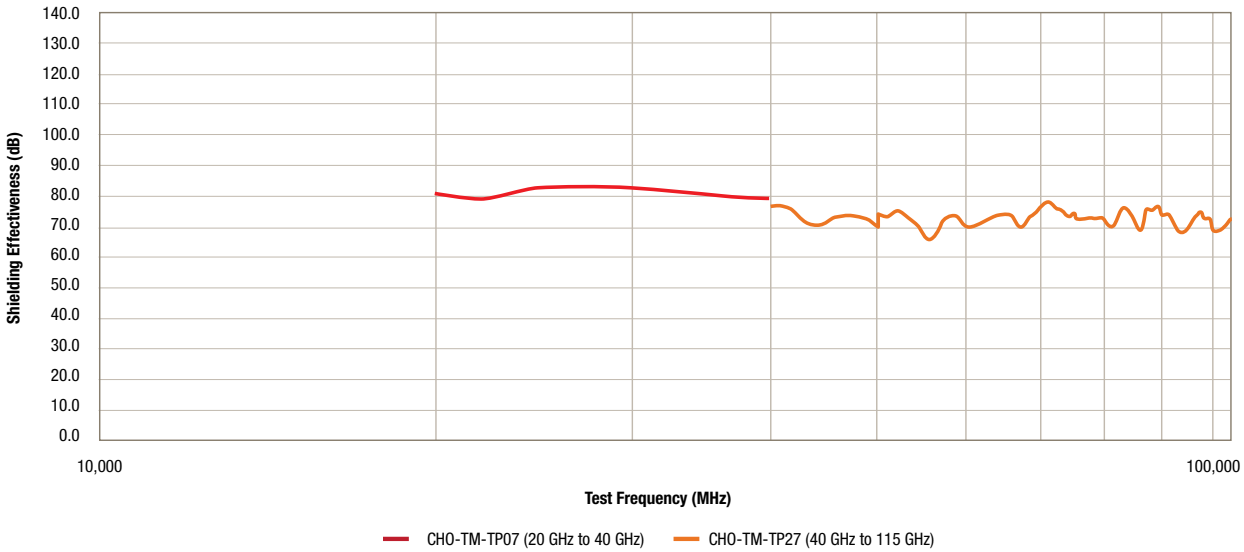


Figure 2 - CHO-SHIELD 608 Typical Shielding Effectiveness per CHO-TM-TP07 and CHO-TM-TP27



A Note on Test Methods Used

Figure 1 illustrates traditional shielding effectiveness test data from 30 MHz to 18 GHz using the CHO-TM-TP11 test method. This method used a 26 inch (660.4 mm) square test sample size, mounted on a 24 inch square (609.6 mm) aperture on the shielded room wall.

Two new test methods are used for testing the frequency range from 20 GHz to 110 GHz. Test methods CHO-TM-TP07 (20 GHz to 40 GHz) and CHO-TM-TP27 (40 GHz to 115 GHz) were developed to be able to use the same test sample throughout the wide frequency range.

Figure 2 illustrates the new test data using a 5.25 inch diameter (133.4 mm) test sample size over the frequency range from 20 GHz to 110 GHz. This smaller test sample size is required to cover such a wide frequency range.

Further information on the testing can be found by downloading the referenced test methods, available from parker.com/chomerics, or upon request from Parker Chomerics Application Engineering.

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CHO-SHIELD® 608 Application Information

Recommended Preparation

Clean the substrate: The substrate surface should be clean, dry and free of oils, release agents, dirt and lint.

Mix the material: CHO-SHIELD 608 is supplied at 51 weight% solids and should be thinned using MEK (Methyl Ethyl Ketone) to a suitable viscosity for application with your specific spray equipment.

Parker Chomerics recommends the material be sprayed at approximately 30% solids (CHO-SHIELD 608 may be sprayed at slightly higher or slightly lower weight % solids depending upon your equipment). Table 2 below shows the approximate weight of solvent which should be added to the CHO-SHIELD 608 to achieve the corresponding weight % solids.

Table 2 - Thinning of CHO-SHIELD 608 for Application

CS 608 Weight % Solids	Weight of MEK per quart of CS 608 (grams)	Weight of MEK per 100 grams of CS 608 (grams)
28	986	80
30	840	70
32	713	59

After thinning with solvent, mix the material well by placing the can on a paint shaker for 3 to 4 minutes 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 or the sides of the container.

1. 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.

Fluid Delivery System

Low Volume Manufacturing - Spray

Use a standard HVLP spray gun with approximately 20 to 40 psi (138 to 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.

Moderate Volume Manufacturing - Spray Gun and Pressure Vessel with Agitation

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 to 50 psi (138 to 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.

High Volume Manufacturing - Robotic Spray Systems

For large volume, precise spray applications, a robotic spray system with constant fluid recirculation should be use to keep conductive particles from separating and settling in the lines. Both ultrasonic and HVLP spray heads may be used to apply the conductive coating. Important factors to consider when determining spray head type are part geometry, masking requirements, overspray tolerance, paint transfer efficiency, and manufacturing cycle time. A fluid nozzle with an orifice diameter of 0.020 to 0.040 inch (0.508 to 1.016 mm) is recommended.

Nominal Dry Film Thickness

A nominal dry film thickness of 0.0005 inches (12.5 µm, 1 mil) is recommended to obtain > 85 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 to 20 minutes at room temperature between coats to avoid solvent entrapment.

Drying Conditions

Dry at room temperature for 10 to 20 minutes.

Continue drying for 15 minutes at 121°C ± 2°C (250°F ± 5°F) for 0.0005 inches (12.5 µm, 0.5 mil) thickness.

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

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 608 should be stored at 10°C to 30°C (50°F to 86°F) and has a 9 month shelf life from the date of manufacturing in the original sealed container. CHO-SHIELD 608 is a flammable liquid. Please consult the material safety data sheet for proper handling procedures before use.

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CHO-SHIELD® 608 Ordering Information

Product	Weight (grams)	Packaging	Part Number	Primer
CHO-SHIELD 608	1200	1 quart aluminum can	52-04-0608-0000	Not Required

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.



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