CHO-SHIELD® 610

Electrically Conductive Silver-Plated Copper Epoxy EMI Coating

Parker Chomerics CHO-SHIELD 610 is a three component, silver-plated copper filled, conductive epoxy paint designed to provide EMI shielding and electrical grounding on plastic and composite substrates. This conductive epoxy system has great adhesion to a variety of substrates, making it a good choice for chemical resistant plastics or other hard to adhere to substrates.

Due to its silver-plated copper filler, CHO-SHIELD 610 is a cost effective EMI solution for applications where good EMI shielding and electrical conductivity are required.

CHO-SHIELD 610 demonstrates exceptional environmental stability, maintaining electrical conductivity, adhesion, and abrasion resistance when subjected to high and low temperature extremes, high humidity, and salt fog corrosion environments.





Product Features

- Three component silver-plated copper flake filler
- Epoxy coating
- Pre-measured kit allows for easy mixing of components in one single container
- Long pot life (8 hours)
- Cost effective
- Very good conductivity and EMI shielding of components
- Coating maintains electrical and mechanical stability in harsh environments
- Good chemical/moisture barrier, hard abrasion resistant coating

Typical Applications

- Military and commercial electronic enclosures
- Missile canisters
- Man portable electronics
- Radar systems
- Avionics boxes
- Engines
- Aluminum flanges and structures

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CHO-SHIELD® 610 Product Information

Typical Properties	Typical Values	Test Method	
Polymer	Epoxy	N/A	
Filler	Silver-Plated Copper	N/A	
Mix Ratio (A/B/C by weight)	100 / 42.4 / 50	N/A	
Color	Copper	N/A	(Q)
Spray Viscosity	20 to 26 seconds	Zahn Cup Number 2	(Q)
Surface Resistance at 0.002 inches (50 µm, 2 mil)	0.150 ohms / square	95-40-5104	(Q/C)
Shielding Effectiveness	>70 dB	CHO-TM-TP11*	(Q)
Recommended Dry Film Thickness	.0.002" (50 µm)	N/A	
Wet Density	1.2	95-40-5504	(Q/C)
Wear Resistance (Taber Abrasion) 1000 Cycles, 1 kg, CS-10, G-10 substrate	Pass	ASTM D4060	(Q)
Continuous Use Temperature	-65 to 125°C (-85 to 257°F)	N/A	(Q)
Pot Life	8.0 hrs	N/A	(Q)
Drying Time - Room Temperature Tack Free	1 hour @ 21°C (70°F)	N/A	
Drying Time - Room Temperature Full Dry**	1 week @ 21°C (70°F)	N/A	
Drying Time - Elevated Temperature Full Dry	Cure Cycle Option 1: 2 hours @ 21°C (70°F), followed by 1 hour @ 66°C (150°F), followed by 1 hour @ 121°C (250°F) Cure Cycle Option 2: 2 hours @ 21°C (70°F), followed by 4 hours @ 79°C (175°F)	N/A	
Calculated VOC	591 g /L	Calculated	
Theoretical Coverage at Recommended Dry Film Thickness	0.051 ft^2/gram .0047 m^2/gram 228 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.
* This test Method is available from Parker Chomerics.
** Cure is sufficient for handling in 24 hours. Full specification properties are developed after 1 week (168 hours) at room temperature.
*** Shelf life may be extended by 3 months. Contact Chomerics for details.

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CHO-SHIELD® 610 Shielding Effectiveness

Figure 1 - Typical Shielding Effectiveness

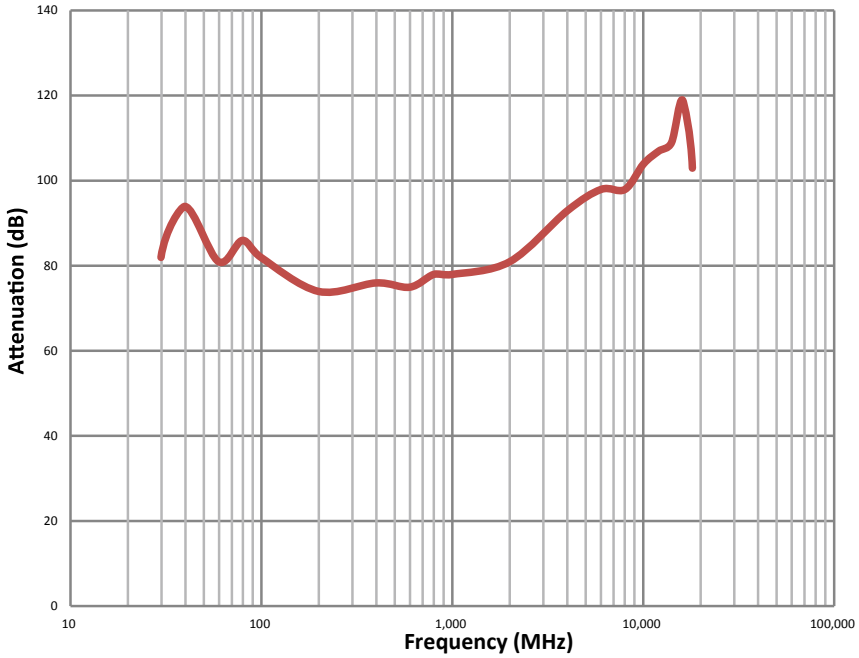
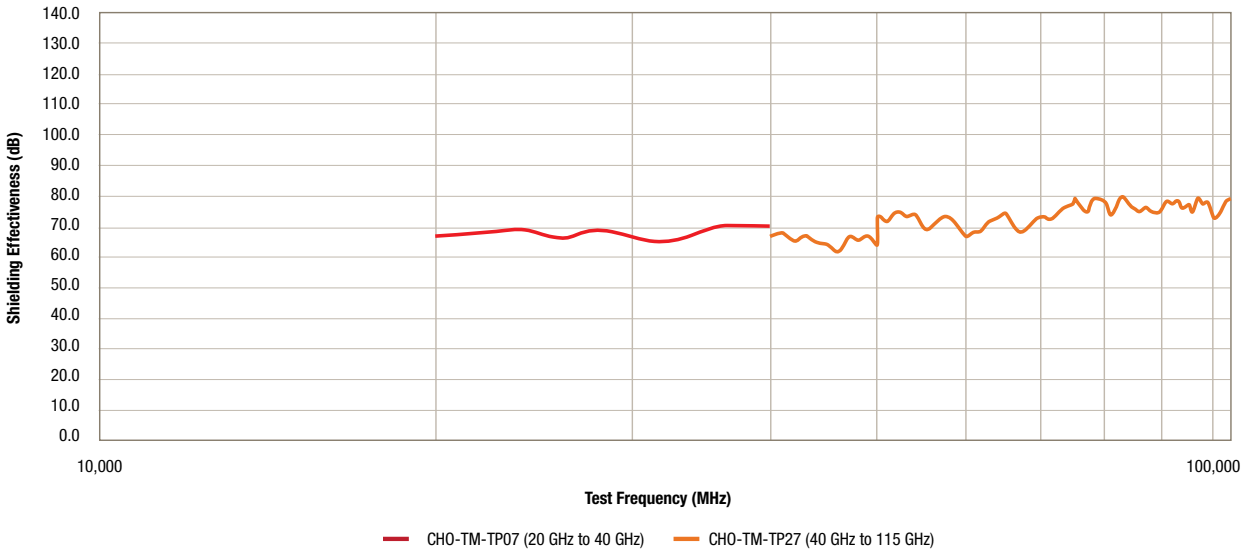


Figure 2 - CHO-SHIELD 610 Typical Shielding Effectiveness per CHO-TM-TP07 and CHO-TM-TP27



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® 610 Ordering Information

These instructions should be followed in mixing and applying CHO-SHIELD 610 coating:

1. Mix Ratio (A: B: C by Weight): 100: 42.4: 50. Add Part C Solvent blend into Part A conductive paste in aluminum gallon can. Mix on a paint shaker for 3 to 5 minutes until homogeneous (do not over mix as it will start to heat up material). Add Part B to Parts A and C in aluminum gallon can and mix on paint shaker and additional 3 to 5 minutes until homogeneous.
2. CHO-SHIELD 610 coating is supplied at a standard spray application viscosity. It may be thinned with MEK (methyl ethyl ketone).
3. Apply the coating with standard HVLP application equipment or with an air gun. It's important to keep the coating agitated during application to keep the conductive particles in suspension.

A suggested spray viscosity is 23 seconds with #2 Zahn Cup. The coating should be 2.0 to 2.5 mil dry film thickness. This can be achieved on simple parts with a single coat. If additional coats are necessary, or if puddling occurs, a 30-minute drying time for solvent flash is required. The last coat should dry at room temperature for at least two hours, followed by the recommended cure cycle.

Note: Over-thinning degrades electrical performance.

Test	Test Conditions	Initial Resistance (mOhm/sq.)	Final Resistance (mOhm/sq.)	Post Adhesion
High Temperature	240 hours @ 85°C	129	151	5B
Low Temperature	240 hours @ -40°C	133	137	5B
Humidity	240 hours @ 65°C and 85-95% RH	125	125	5B
Salt Fog	96 hours ASTM B-117	119	196	5B
Taber Abrasion	Taber CS-10 wheel, 1000 cycles, 500 gram weights	Weight loss 75 mg	-	-

Product	Weight (grams)	Packaging	Part Number	Primer
CHO-SHIELD 610	3,769	3 component kit A: 1 gallon aluminum can B: 1.25L Aluminum bottle C: 1.25L Aluminum bottle	52-03-0610-0000	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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