

# CHO-SHIELD® 610

## ELECTRICALLY CONDUCTIVE SILVER-PLATED COPPER EPOXY EMI COATING



### Customer Value Proposition:

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.

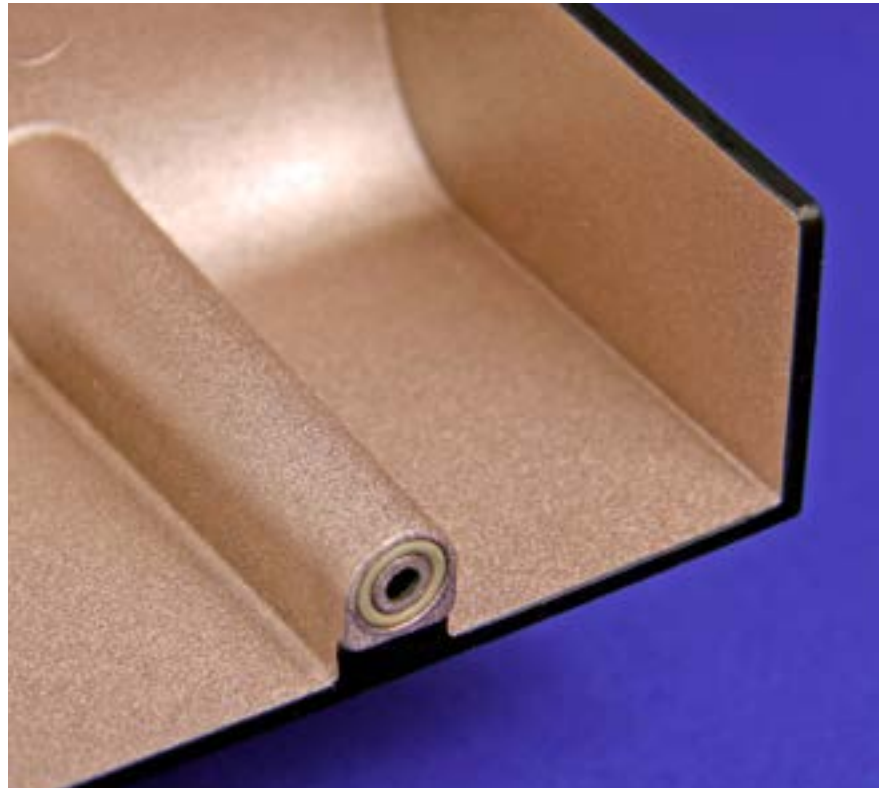
Typical applications include military and commercial electronic enclosures, missile canisters, man portable electronics, radar systems, avionic boxes, engines, and aluminum flanges and structures.

### Contact Information:

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### Features and Benefits:

- Three component
- Silver-plated copper flake filler
- Epoxy coating
- Pre-measured kit allows for easy mixing of components in one single container
- Long post 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



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## CHO-SHIELD 610 - Product Information

Table 1 Typical Properties

| CHO-BOND 610  |   |                       |
|---|---|-----------------------|
| 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 (max.) at 0.002 inches (50 µm, 2 mil)                  | <= 0.150 ohms / square  | CEPS-0002 (Q/C)       |
| Shielding Effectiveness (see Figure 1)                                    | >70 dB  | CHO-TM-TP11 * (Q)     |
| Recommended Dry Film Thickness  | .002" (50 µm)   | N/A                   |
| Wet Density   | 1.2   | ASTM D792 (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)<br>Cure Cycle Option 2: 2 hours @ 21°C (70°F), followed by 4 hours @ 79°C (175°F) | N/A                   |
| Shelf Life at 21°C (70°F), unopened, from Date of Manufacture             | 9 months ***  | N/A (Q)               |
| Calculated VOC  | 591 g /L  | Calculated            |
| Theoretical coverage at recommended dry film thickness                    | 0.051 ft <sup>2</sup> /gram<br>.0047 m <sup>2</sup> /gram<br>228 ft <sup>2</sup> /gallon  | 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.

### APPLICATION INSTRUCTIONS

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

- 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 3-5 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 3-5 minutes until homogeneous.
- CHO-SHIELD 610 coating is supplied at a standard spray application viscosity. It may be thinned with MEK (methyl ethyl ketone).
- Apply the coating with standard HVLP application equipment or with an air gun. Its 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 mils 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.



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## CHO-SHIELD 610 - Product Information

Table 2 Typical Test Data

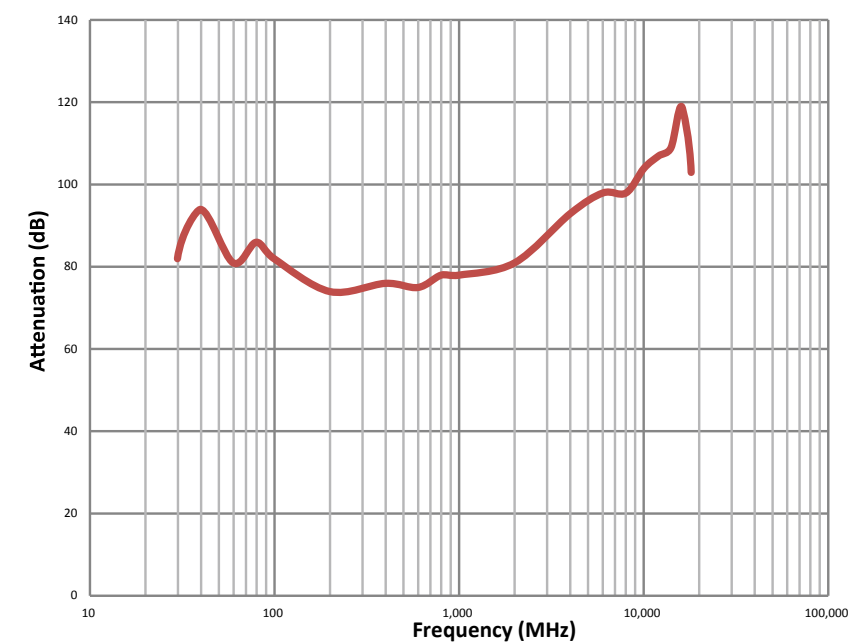
| CHO-SHIELD 610   |  |                               |                             |               |
|------------------|--|-------------------------------|-----------------------------|---------------|
| Test             | Test Conditions                                  | Initial Resistance (mOhm/sq.) | Final Resistance (mOhm/sq.) | Post Adhesion |
| High Temperature | 240 hrs. @ 85 °C                                 | 129                           | 151                         | 5B            |
| Low Temperature  | 240 hrs. @ -40 °C                                | 133                           | 137                         | 5B            |
| Humidity         | 240 hrs. @ 65 °C and 85-95% RH                   | 125                           | 125                         | 5B            |
| Salt Fog         | 96 hrs ASTM B-117                                | 119                           | 196                         | 5B            |
| Taber Abrasion   | Taber CS-10 wheel, 1000 cycles, 500 gram weights | Weight loss 75 mg             | -                           | -             |

Table 3 Ordering Information

| Product        | Weight (grams) | Packaging   | Chomerics Part No. | Primer Included |
|----------------|----------------|---|--------------------|-----------------|
| CHO-SHIELD 610 | 3,769          | 3 component kit<br>A: 1 gallon aluminum can<br>B: 1.25L Aluminum bottle<br>C: 1.25L Aluminum bottle | 52-03-0610-0000    | Not Required    |

Figure 1

CHO-SHIELD 610 Shield Effectiveness PER CHO-TM-TP11\*



\* This test Method is available from Parker Chomerics.

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