CHO-SHIELD® 4994

Electrically Conductive Silver Polyurethane Coating for Airframes

Parker Chomerics CHO-SHIELD 4994 is a smooth, highly conductive flexible silver-filled polyurethane coating designed for military/aerospace airframe applications.

The coating provides superior adhesion, excellent solvent rub and wear resistance, and is resistant to numerous operational and environmental fluids.

CHO-SHIELD 4994 can be applied to aluminum as well as non-conductive substrates and is designed to be used with primers and with external topcoat systems.



Product Features

- Superior conductivity, flexibility and fluid resistance.
- CHO-SHIELD 4994: 3 hour pot life with 7 day full cure under ambient conditions.
- Coating can be cured under heat accelerated conditions within 4 hours.
- Designed for application by standard high volume low pressure spray equipment.

Typical Applications

- Military/aerospace airframes



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CHO-SHIELD® 4994 PRODUCT INFORMATION

Typical Properties	Typical Values	Test Method	
Resin	Polyurethane	-	
Filler	Silver	-	
Color	Tan	-	
Shielding Effectiveness	85 dB (200 - 10,000 MHz)	Modified Chomerics TP-08	(Q)
Surface Resistance at 3 mil	< .075 ohms / square	CEPS-0002	(Q/C)
Adhesion	5B	ASTM D3359	(Q/C)
Specific Gravity	2.3 g/mL	ASTM D792	
Mix Ratio (A/B/C/D by weight)	100 / 18.3 / 1.4 / 20.9	-	
Recommended Cure Schedules	Cure Cycle Option 1: 2 Hours @ Standard Conditions + 2 hrs @ 54ºC (130ºF) Cure Cycle Option 2: 7 Days @ Standard Conditions 16 to 21ºC (60-70ºF) 40 to 60% RH	-	
Recommended Dry Film Thickness (DFT)	0.003 - 0.004	-	
Continuous Use Temperature	-40°C to 85°C (-40°F to +85°F)		(Q)
Theoretical coverage , 3 mil	0.030 ft^2/gram; 0.0028m^2/gram; 259 ft^2/gallon	ASTM D2697	(Q)
Calculated VOC (Less H_2O and Exempt Solvents)	615 g/L	USEPA Method 24	(Q)
Wet Density	2.1 (g/cc)	ASTM D1475	(Q/C)
Pot Life	3.0 Hours	ASTM D4212	(Q/C)
Solvent Rub Resistance	Pass	CHO-TM 95-40-6013	(Q/C)
Wear Resistance (Taber)	Wear Index: 0.160 (mg/cycle); Wear Cycles per mil: 1000	ASTM D4060	(Q)
Pencil Hardness	Scratch : 4H; Gouge: 2H	ASTM D3363	(Q)
Impact Testing, Aluminum	Intrusion: 40 (ft/lb) / Extrusion: 40 (ft/lb)	ASTM D2794	(Q)
Mandrel Bend, Aluminum	30%	ASTM D522 - Test Method B	(Q)
Conical Bend, Aluminum	Elongation: ⩾ 32.0%	ASTM D522 - Test Method A	(Q)
Surface Resistance, Aluminum	185ºF 14 days; -40ºF 14 days; 185ºF 85%RH 30 Days: < .075 (Ω/Sq.)	CEPS-0002	(Q)
Cross Hatch Adhesion, Aluminum	5B	ASTM D3359	(Q)
Visual Inspection, Aluminum	Pass		(Q)
Fluid Resistance, Aluminum and Composite	MIL-T-5624 JP-8 14 Days @ 72ºF; MIL-H-5606 Hydraulic Fluid 7 Days @ 160ºFl; MIL-L-7808 Lubricating Oil 7 Days @ 160ºF: < .075 (Ω/Sq.)	CEPS-0002	(Q)
Cross Hatch Adhesion, Aluminum and Composite	Pass	CHO-TM 95-40-6013	(Q)
Visual Inspection, Aluminum and Composite	Pass		(Q)
Shelf Life, unopened, from date of manufacture	6 Months		(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.

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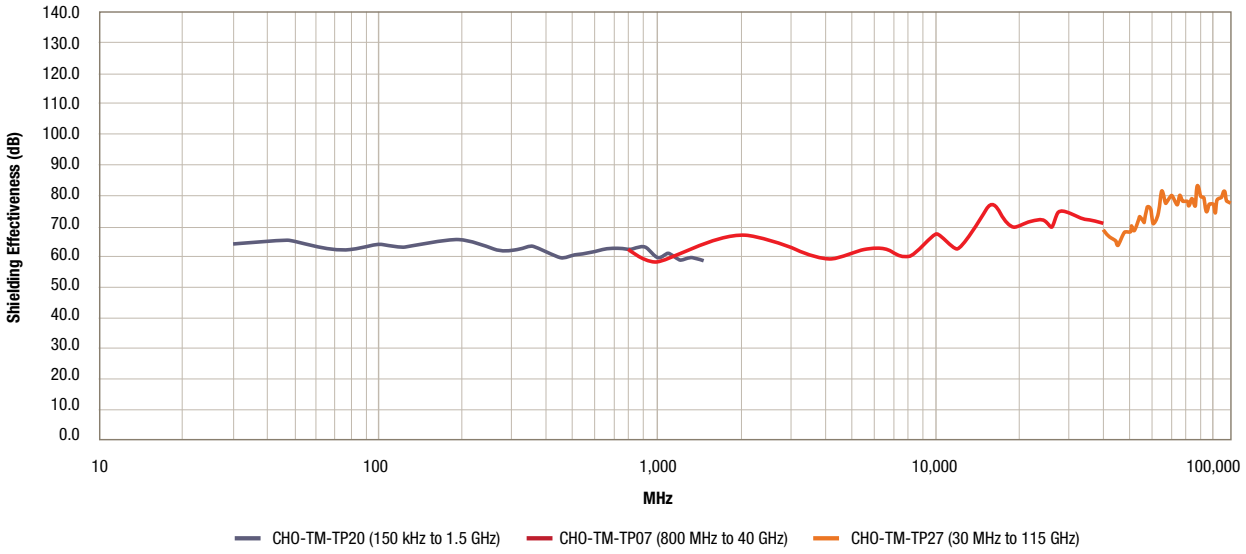
CHO-SHIELD® 4994 SHIELDING EFFECTIVENESS

Figure 1 - Typical Shielding Effectiveness



A Note on Test Methods Used

Figure 1 illustrates the shielding effectiveness test data from 30 MHz to 18 GHz.

Test Method CHO-TM-TP20 (ASTM D4935) was used over the 30 MHz to 1.5 GHz frequency range. This test method uses a test sample 5.25 inch diameter (133.4 mm) in size.

Two new test methods are used for testing the frequency range from 1.5 GHz to 110 GHz. Test methods CHO-TM-TP07 (1.5 GHz to 40 GHz) and CHO-TM-TP27 (40 GHz to 115 GHz) were developed to be able to use the same test sample as used for CHO-TM-TP20 above throughout the 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.

CHO-SHIELD® 4994 APPLICATION INFORMATION

Recommended Preparation

Clean the substrate: The substrate should be clean, dry and free of oils, release agents, dirt and lint. Clean aluminum surfaces with methyl ethyl ketone (MEK) or isopropyl alcohol / ethanol for solvent sensitive substrates. Let the substrate air dry for 15 minutes.

Mix the material: Mix the CHO-SHIELD 4994 coating in this order: Combine Part C and Part D to Part A using the weight ratios given in Table 1 and mix. Shake on a paint shaker until uniformly dispersed. Do not shake the paint so much that it gets warm or hot. Check for the homogeneity of the mixture by feeling the sides and bottom of the container with a spatula to assure all the filler and resin are well dispersed.

Add the Part B using the weight ratios given in Table 1 and shake / mix for an additional 3 minutes.

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CHO-SHIELD® 4994 ORDERING INFORMATION

Product	Weight (grams)	Packaging	Chomerics Part No.	Primer Included
CHO-SHIELD 4994	1802	4 component, 1 quart aluminum can kit	52-04-4994-1000	Not Required
	7210	4 component, 1 gallon aluminum can kit	52-03-4994-1000	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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