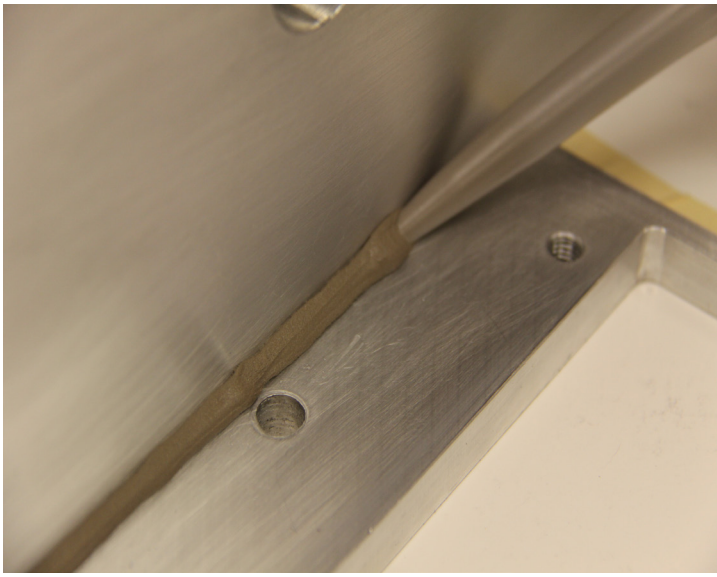
Powder Coating CHO-BOND 1019

High temperature exposure tips and tricks

THE CHALLENGE

CHO-BOND 1019 is widely used as a fillet or gap filler caulking material in the interconnecting seams of defense shelters and electronic enclosures. CHO-BOND 1019 is a highly conductive silver plated aluminum filled, two-component conductive polythioether sealant. The advantage of the CHO-BOND 1019 system is that it is paintable – eliminating the need for an additional primer application before painting. The challenge is that the continuous use temperature for CHO-BOND 1019 is – 62°C to 160°C {-80°F to 320°F} and typical powder coating paint processes exceed this temperature to a high of 375°F for 45 minutes in the process.



DESIGN REQUIREMENTS

CHO-BOND 1019 is typically applied to an enclosure directly on the metal surface or after a conversion coating process.

After application of CHO-BOND 1019 and waiting the MINIMUM recommended cure time of 3 days, the material can be painted over. The material will continue to cure even after painting and full cure will be achieved in one week at room temperature.

Powder coating is a type of coating that is applied as a free-flowing, dry powder. The main difference between a conventional liquid paint and a powder coating is that the powder coating does not require a solvent to keep the binder and filler parts in a liquid suspension form. The coating is typically applied electrostatically and is then cured under heat to allow it to flow and form a "skin." The curing temperature typically reaches 375°F which exceeds the continuous use temperature of CHO-BOND 1019 by 55°F but it's for a short period of 45 minutes.

KEY FEATURES

Some of the key features of CHO-BOND 1019 are as follows:

- The silver aluminum filler of CHO-BOND 1019 provides excellent corrosion resistance when applied to aluminum substrates.
- CHO-BOND 1019's custom formulated polythioeather polymer system is paintable – eliminating the time and cost of an additional primer application step before painting.
- CHO-BOND 1019 cures to the touch in 24 hours and provides a robust conductive and environmental seal.
- CHO-BOND 1019 is qualified on hexavalent chromium IAW MIL-DTL-5541 Type I, Class 1A and trivalent Type II, Class 3 in hash conditions including heat, humidity and salt fog where it maintains stable EMI shielding performance.
- The overcoat adhesion has been qualified by MIL-PRF-23377 Type II, Class N and MIL-DTL-53022 Type II epoxy primers.
- CHO-BOND 1019 can be applied in very thin recommended bond lines of 0.010 inches {0.25mm} up to a maximum thickness of 0.250 Inch {6.35mm}.

CONCLUSION

Parker Chomerics has recently performed testing on CHO-BOND 1019. The material was applied to aluminum substrates and put in a temperature chamber after fully cured. The temperature chamber was ramped up to a temperature of 357°F for a period of 45 minutes.

After removing the samples from the temperature chamber the test samples were evaluated for electrical and mechanical properties as shown in the table below

Parameter	Units	Lower Limit	Upper Limit	Control	350°F	375°F	Procedure
Visual Check OK?	Y/N			Y	Y	Y	95-40-6081
Hardness, Shore A Std.	Shore A	64	80	65	72	66	ASTM-D2240
Specific Gravity		1.8	2.4	2.02	2.02	1.93	ASTM-D792
Tensile Strength	PSI			218	154	195	ASTM-D412
Percent Elongation	%			11.66	16.87	13.33	ASTM-D412
Volume Resistivity, Std.	Ohm-cm		0.01	0.0064	0.0037	0.0041	90-40-5555
Lap Shear	psi	65		94	164	138	95-40-5300

The CHO-BOND 1019 showed no significant deterioration in mechanical or electrical properties after heat aging the material at 375°F for 45 minutes.

THE CHOMERICS SOLUTION

Parker Chomerics CHO-BOND 1019 is an excellent choice for sealing seems on a shelter or enclosure when finishing by painting using a powder coat process. The shelter or enclosure will achieve exceptional corrosion resistance, volume resistivity of 0.01 Ohm-cm and greater than 80dB of shielding effectiveness from 300MHz to 18GHz.

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