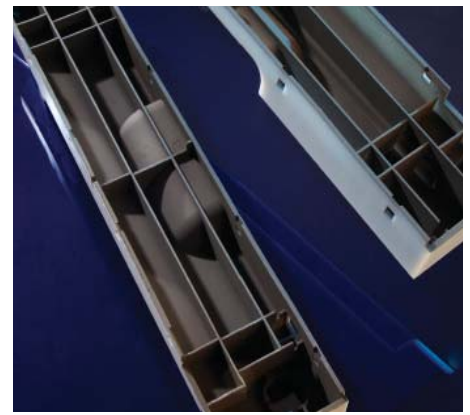


Nickel-Filled Acrylic Coating for EMI Shielding

CHO-SHIELD® 2044



Customer Value Proposition:

CHO-SHIELD® 2044 is an electrically conductive, one-component nickel-filled acrylic coating that is specially formulated for application on plastics to provide modest EMI shielding.

CHO-SHIELD 2044 is ideal for use on electronic enclosures and assemblies. The electrical conductivity of the durable, nickel-composition paint allows for simple, standard application using conventional equipment with minimal dry-time and handling.

CHO-SHIELD 2044 is ideal for use on electronic enclosures and assemblies where abrasion resistance and coating durability are important. This durable, conductive coating derives its hardness from its nickel composition and may provide limited amounts of H-field shielding. Given its relatively low conductivity as compared to other metal fillers, the nickel provides exceptional shielding for enclosures where both external RF fields must be excluded, and internal radiated emission must be attenuated.

CHO-SHIELD 2044 conductive coating is ideal for a variety of applications, including:

- Moderate EMI shielding (see shielding effectiveness curve Fig.1)
- Anti-static protection
- Surface grounding
- Coating of ABS, PC/ABS, and many other types of plastic enclosures



Product Benefits:

- Good EMI shielding performance at standard thickness and application
- Good adhesion to a variety of substrates
- One component, ready to use with simple mixing
- Good environmental and abrasion resistance
- Good leveling. Wets and covers surfaces smoothly.
- Easy to apply with standard spray paint equipment
- Standard dry-times for efficient, cost-effective application
- Good electrical conductivity and cost-effective addition to electronic enclosures and assemblies

Contact Information:

Parker Hannifin Corporation
Chomerics Division
77 Dragon Court
Woburn, MA 01801
phone 781 935 4850
fax 781 933 4318
chomailbox@parker.com
www.parker.com/chomerics

Application

Recommended Preparation

1. Clean the substrate:
The substrate surface should be clean, dry and free of oils, release agents, dirt and lint.
2. Mix the material:
CS 2044 is supplied at 42 weight% solids and should be thinned using MEK (Methyl Ethyl Ketone) to a suitable viscosity for application with your specific spray equipment.

Chomerics recommends the material be sprayed at approximately 30% solids (CS 2044 may be sprayed at slightly higher or slightly lower weight % solids depending upon your equipment). Table 1 below shows the approximate weight of solvent which should be added to the CS 2044 to achieve the corresponding weight % solids

Table 1: Weight of MEK to add in grams

CS 2044	Weight % Solids		
	28%	30%	32%
Gallon (3919 g)	1960	1568	1225
Quart (980 g)	490	392	306
100 g	50	40	31

When spraying CS 2044 in a humid environment (R.H. > 50%), retard blushing by substituting 200 grams of n-butanol (also called n-butyl alcohol CAS# 71-36-3) for MEK per gallon of CS 2044 before spraying

3. After thinning with solvent, mix the material well by placing the can on a paint shaker for 3-4 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.
Note: A magnetic agitator should be avoided as it will attract nickel particles and adversely affect the application.
4. 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

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 20-50 psi (138-345 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.

For large volume applications, a robotic spray system with an HLVP spray gun should be used to minimize material loss due to overspray and maximize paint transfer efficiency. Siphon feed equipment can be used for small or prototype runs.

Spray Gun and Pressure

Use a standard air gun with approximately 20-50 psi (138-345 kPa) atomizing air.

A fluid nozzle with an orifice diameter of 0.040 to 0.070 inch (1.016 to 1.778 mm) is recommended.

To obtain maximum adhesion and conductivity, dry spraying should be avoided. Adjust the spray pressure to achieve a proper wet film.

Nominal Dry Film Thickness

A nominal dry film thickness of 0.002 inches (50 µm, 2 mils) is recommended to obtain > 60 dB shielding effectiveness from 80 MHz to 10 GHz. However, a thinner or thicker coat may be acceptable depending on the shielding requirements of the device being protected.

Allow material to dry 10-20 minutes at room temperature between coats to avoid solvent entrapment.

Drying Conditions

1. Dry at room temperature for 10-20 minutes.
2. Continue drying for 45 minutes at 150°F ± 10°F (65°C ± 5.5°C) for 0.002 inches (50 µm, 2 mils) thickness.

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

Note: Drying at room temperature for 24 hours will achieve similar performance.

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 2044 should be stored at 50°F to 86°F (10°C to 30°C) and has a 9 month shelf life from the date of manufacturing in the original sealed container. CHO-SHIELD 2044 is a flammable liquid. Please consult the material safety data sheet for proper handling procedures before use.

Product Information

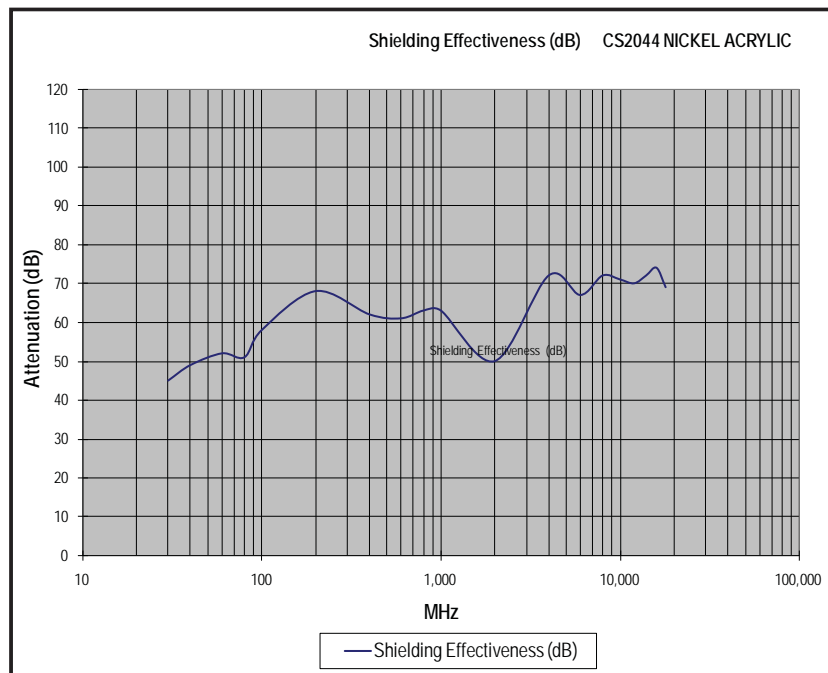
Typical Properties	CHO-SHIELD® 2044
Polymer	Acrylic
Filler	Nickel
Shielding Effectiveness	>60 dB (80 MHz - 10 GHz)
Surface Resistance (max.) at 0.002 inches (50 µm, 2 mils) (CEPS-0002)	1.0 ohm/sq.
Adhesion (ASTM D-3359)	5B
Average solids (weight)	42%
Viscosity (Zahn Cup No. 2)	15 to 25 seconds
Specific Gravity (ASTM D792)	1.2 ± 0.2
Drying Time – Room Temperature Tack Free	30 minutes at RT
Drying Time – Room Temperature Full Dry	24 hours at RT
Elevated Temperature Full Drying time	15 min. at room temperature then 45 minutes at 150°F (65°C)
Continuous Use Temperature	-40 to 185°F (-40 to 85°C)
Shelf Life at 70°F (21°C)	9 months
Theoretical coverage	122 sq ft /gal at 0.002 inches (50 µm, 2 mils)
Calculated VOC	755 g/L

Ordering Information

Product	Part Number	Unit Size
CHO-SHIELD® 2044	52-03-2044-0000	1 gallon

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.

Figure 1 - CHO-SHIELD® 2044 Typical Shielding Effectiveness Per CHO-TP09



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