

EMCoat Shielding Paint

CONDUCTIVE COATING FOR ELECTROMAGNETIC SHIELDING



EMCoat is an electrically conductive, multipurpose, patented coating product that shields secure facilities, wireless communications, and sensitive electronics from hacking, spectrum congestion, unwanted emanations, and damaging electromagnetic attacks. Fast drying, non-toxic, and highly durable, EMCoat is well suited for exterior and interior use and is applied with standard painting equipment. Provides a strong performance in broadband shielding, making it ideal for electromagnetic protection in secure facilities, data centers, meeting areas, operational environments, sensitive medical device rooms, or any area where signal control is a concern.

- Superior protective performance
- Excellent adhesion on a wide range of surface
- Water based, non-toxic, easy clean-up
- Fast drying, low odor
- Rated for indoor and outdoor use
- Saves time & money over metals/foil

PRODUCT	PART#	COVERAGE*	SHIELDING**	APPLICATION	DURABILITY***	LOCATIONS****
EMCoat S	4PA091	200	~55+ dB	Sprayer	High	Indoor
EMCoat R	4PA081	175	~55+ dB	Roll/Brush	High	Outdoor/Indoor
EMCoat HD	4PA079	200	~55+ dB	Roll/Brush	Superior	Outdoor/Indoor

* Square feet per gallon, applied in two coats to achieve 0.6 ohm/square and 60+ dB ** 100 MHz to 18+ GHz, Plane Wave ***ASTM D3359, Crosshatch Adhesion **** Tested and approved for use on drywall, concrete, masonry, metal, wood, vinyl, plastic, and fiber-reinforced composite. Substrate-compatible Primers are always recommended. Test an inconspicuous area or sample section if needed.



**PROVIDES SUPERIOR
ELECTROMAGNETIC
PROTECTION FROM:**



EMP, RFI, EMI



CELLULAR



WIFI



GPS, NFC,
BLUETOOTH

HACKING



DATA
GATHERING



SPECTRUM
CONGESTION



EMCOAT SHIELDING PAINT
STOPS WIRELESS EMANATION OR INTRUSION



EMCOAT TECHNICAL INFO

WHERE: EMCoat conductive coatings are designed for electromagnetic shielding of properly prepared drywall, wood, concrete, masonry, metal, and other compatible building surfaces.

- **EMCoat S** is intended for interior spray applications.
- **EMCoat R** and **EMCoat HD** are suitable for interior and exterior applications and are designed for roller or brush application. Decorative architectural coatings may be applied over EMCoat where appropriate.

SURFACE PREPARATION: Surfaces should be free of dirt, oil, loose paint, construction debris, and other foreign matter. Scuff sand glossy substrates and existing paint layers. Surfaces should be primed with a compatible primer suitable for the substrate (latex primer for drywall, self-etching primer for metal, masonry primer for concrete, etc.).

Proper surface preparation is critical to overall product performance. Fill all gaps and holes, and apply the product liberally in corners, as even small voids or inconsistencies in coating thickness can reduce shielding effectiveness. For larger gaps, EMCaulk Shielding Caulk is recommended for best performance.

COVERAGE: Coverage varies by product.

EMCoat S - 200 sq ft/gal | EMCoat R - 175 sq ft/gal | EMCoat HD - 200 sq ft/gal

APPLICATION TEMPERATURE: Do not apply below 50°F or when relative humidity exceeds 85%.

Proper ventilation, air movement, and humidity control will improve drying time and overall coating performance.

THINNING: Do not thin or dilute.

APPLICATION INSTRUCTIONS: EMCoat is a high-performance, high-viscosity conductive coating. Settling of the conductive components during storage is normal. Thoroughly mix the product to a uniform consistency immediately before use. Shaking is not sufficient. Use a drill with a straight-vane mixing paddle (such as those used for joint compound or grout). Helical-style paddles are not recommended.

Start mixing slowly to minimize splashing and material loss. It may take 15–20 minutes to fully mix a large pail. Be sure to scrape material from the bottom and sides of the container during mixing. Re-mix the product at least every 10 minutes, or use a bucket agitator to maintain uniform dispersion of the conductive components throughout application.

Apply a minimum of two full coats to achieve uniform shielding coverage. Apply generous, full-bodied coats and ensure complete coverage, especially around corners, seams, and penetrations. Tight areas may require multiple light coats to achieve adequate coverage while preventing runs. Uniform coating thickness is essential for optimum shielding performance.

Application Method

EMCoat S: Apply using commercial-quality airless spray equipment.

EMCoat R: Apply by roller or brush.

EMCoat HD: Apply by roller or brush.

For large projects, using a two-person installation team is recommended, with one person applying the coating while the other prepares and mixes additional material.

EMCoat S (4PA091) – Spray Application

Do not thin the product. To avoid clogging of equipment, do not allow the product to settle inside the hose or pump. Start pressure at approximately 50% of the equipment rating and increase as needed. Remove all filters from the spray equipment except the main feed tube screen. Strainers and filters should be 30 mesh or larger. Use a new screen at the start of each job.

Recommended Tip Sizes: HVLP: 2.2 mm or larger | Airless: 417 tip or equivalent.

EMCoat R (4PA081) & EMCoat HD (4PA079) - Roller Application

A 3/4-inch nap roller is recommended to achieve optimum distribution of conductive particles and ease of application. Shorter nap or microfiber rollers are not recommended.

EMCoat R (4PA081) & EMCoat HD (4PA079) - Brush Application

Use a high-quality synthetic brush and apply the product liberally.

When brushing or rolling EMCoat R or EMCoat HD, apply generous, full-bodied coats and avoid overworking the product. Watch for and avoid areas with excessive or insufficient concentrations of conductive solids to ensure uniform shielding performance.

COATS: Multiple coats provide the most consistent coverage and optimum shielding performance. Apply a minimum of two full coats. For best results, apply the first coat with approximately 50% overlap, then apply the second coat perpendicular (cross coat) to the first. A third coat may be applied where additional shielding performance is desired.

RECOAT TIME: Apply additional coats once the previous coat is dry to touch.

DRY TIME: Full curing is required to achieve maximum signal attenuation. See notes on application temperatures to help reduce dry times. Allow at least 24 hours before testing product. Additional time may be necessary in high humidity or low temperature conditions.

CLEAN UP: Clean immediately after use with soap and warm water. Clean all equipment according to manufacturers specifications.

DISPOSAL: Dry product can be disposed of with standard practices for paint products.

STORAGE: Store product at room temperature and do not allow to freeze. It is not recommended to store EMCoat products for longer than six months. Product must be remixed immediately prior to application.

PRECAUTIONS:

- Refer to Product Safety Data Sheet before use
- EMCoat S is intended for interior applications only. EMCoat R and EMCoat HD are suitable for both interior and exterior applications.
- Do not sand.
- Not recommended for use as a finished flooring product. EMCoat must be protected by a suitable architectural finish product for floor installations.
- Priming metal with non-conductive coatings can interrupt the electrical connection between the metal and the paint.
- Any connection to or through a shielding layer can have adverse effects upon the efficacy of the shield. Consult a qualified shielding professional for proper installation of fasteners.

GROUNDING: Grounding of conductive surfaces may be required by your local electric code. Please consult with a licensed professional electrician.

BASE: Water-borne Urethane **COLOR:** Dark Grey

TOTAL VOC: 111 g/L

VOC: (less exempt solvents): 290g/L

DENSITY: 1452 g/L

VOLUME: .88 gal or 4.3 gal per container

SOLIDS (WT.): 54% +/- 2%

SOLIDS (VOL.): 31% +/- 2%

For consultation to obtain maximum performance of a shielded enclosure, contact Faraday Structures at sales@FaradayStructures.com or see www.FaradayStructures.com

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of the Conductive Group. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your company representative to obtain the most current versions of product documentation. The Conductive Group believes this information and test values to be typical, however, the Conductive Group does not assume any liability whatsoever for accuracy or completeness of any information contained in this document. The Conductive Group does not warrant this product with respect to merchantability or suitability for use, including any intellectual property or trade restrictions, which is the sole responsibility of the purchaser and/or end user. Use of products from the Conductive Group requires compliance with the Conductive Group Standard Terms and Conditions. Always refer to materials handling instructions and safety documentation when using this or any other material. Copyright ©2020 Conductive Group, LLC

LEAD WARNING: Warning! Removal of pre-existing paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

SHIELDING EFFECTIVENESS OF EMCOAT PAINT

TECHNICAL BULLETIN

OVERVIEW

EMCoat is a family of water-based electrically conductive architectural coatings developed, manufactured, and sold by Faraday Structures, a division of the Conductive Group.

EMCoat conductive coatings are designed to provide RF shielding for interior and exterior applications, depending on the product selected. The EMCoat product family includes:

- EMCoat S (4PA091) – Interior spray application
- EMCoat R (4PA081) – Interior / Exterior roller and brush application
- EMCoat HD (4PA079) – Interior / Exterior roller and brush application

This technical bulletin presents shielding effectiveness test results obtained using standard EMCoat coating systems.



PREPARATION

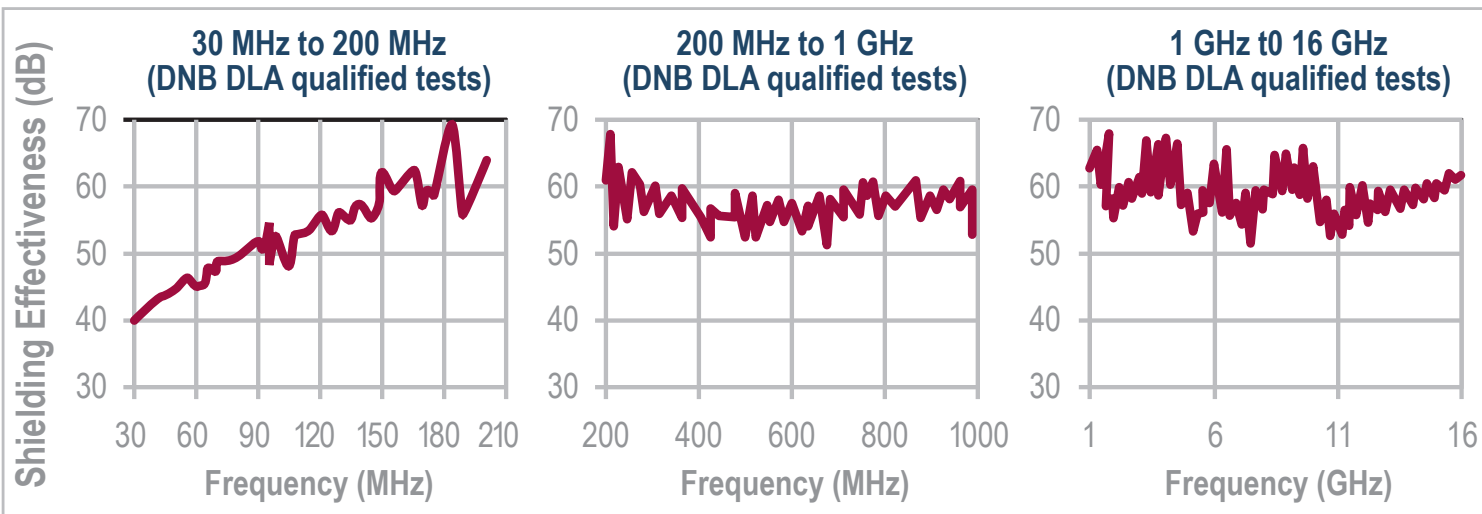
Test panels were properly prepared, primed, and coated in accordance with EMCoat application guidelines using the recommended dry film thickness for optimum shielding performance.

TEST METHODS

Panels were sent to DNB Engineering (Fullerton, CA) for testing from 30 MHz to 1 GHz. DNB Engineering is a DOD Qualified Suitable Laboratory under the Defense Logistics Agency (DLA) Standardization Program. Specifically, DLA has qualified DNB to perform electromagnetic shielding testing under MIL-DTL-38999, requirement paragraph, 3.32, test paragraph 4.5.28, EMI shielding and EIA-364-66, EMI Shielding Effectiveness. The DNB facility consists of a 24 ft x 12 ft x 12 ft welded steel room bisected by a welded steel wall containing a window in which the sample is placed. This dual room steel chamber is essentially free of electromagnetic artifacts and noise.

RESULTS

Test results show shielding effectiveness of ~55 dB average across the frequencies tested. Shielding of 40 dB at 30 MHz quickly increases to 60 dB by 150 MHz, then ~55 to 60 dB of attenuation through 1 GHz.





EMCOAT CONDUCTIVE PAINT INSTALLATION & INSPECTION GUIDE

When properly installed, EMCoat conductive coatings from Faraday Structures provide a high-performance, cost-effective solution for architectural electromagnetic shielding applications.

To ensure proper installation and prevent re-work, Faraday Structures recommends proper installation techniques and application quality control processes. The quality control steps described herein can be performed throughout the installation process by anybody that is sufficiently trained in the procedures contained in this guide.

Performing simple quality control steps during installation can provide peace of mind and help to avoid costly re-work.

While many factors influence the overall performance of a shielded enclosure, one effective method of verifying proper installation is to measure surface resistivity across coated surfaces, seams, and other critical features. Performing these measurements throughout installation provides crews with a practical method of confirming performance and identifying any issues before project completion.

Certification and final acceptance testing should be performed by qualified personnel. However, the quality control procedures described in this guide may be completed throughout the installation process by personnel who have been trained in these procedures.

EMCOAT PAINT - INSTALLATION GUIDELINES

EMCoat conductive coatings provide a unique combination of electromagnetic shielding performance and ease of application. Depending on the product selected, EMCoat coatings may be applied by spray, roller, or brush, making them suitable for a wide variety of architectural shielding applications.

Generally stated, a proven way to achieve high performance in electromagnetic shielding projects is to create a complete faraday cage enclosure. This requires attention to design and shielding treatment to all surfaces, entry and exit points, doors, windows, utilities and services, communication lines, or any other point that goes through the shield barrier. While this is not possible in every project or installation, users and installers of shielding products need to understand that there are many variables that affect the shielding performance of a space besides the surface coatings. A properly applied coating as part of a shielded space is only one component in shielding performance, and the actual shielding performance of the space will be a function of the “weakest” area – much as a chain is only as strong as it’s weakest link. A properly applied EMCoat coating is only one component of an effective shielding system. Overall shielding performance depends on the integrity of the entire enclosure, with the weakest point ultimately determining overall effectiveness.

The installation instructions provided in this guide are consistent with the instructions included with EMCoat products. If additional assistance is required, please contact your sales representative or Faraday Structures Technical Support.

EMCOAT PAINT - INSTALLATION GUIDELINES CONT'D

WHERE: EMCoat conductive coatings are designed for electromagnetic shielding of properly prepared drywall, wood, concrete, masonry, metal, and other compatible building surfaces.

EMCoat S is intended for interior spray applications. | **EMCoat R and EMCoat HD** are suitable for interior and exterior applications and are designed for roller or brush application.

SURFACE PREPARATION: Surfaces should be free of dirt, oil, loose paint, construction debris, and other foreign matter. Scuff sand glossy substrates and existing paint layers. Prime surfaces with a compatible primer suitable for the substrate (latex primer for drywall, self-etching primer for metal, masonry primer for concrete, etc.).

Proper preparation is critical to overall product performance. Fill all gaps and holes, and apply the coating liberally in corners, as small voids or inconsistencies in coating thickness can reduce shielding effectiveness. For larger gaps, EMCaulk Shielding Caulk is recommended.

COVERAGE: Coverage varies by product.

EMCoat S: 200 sq ft/gal | **EMCoat R:** 175 sq ft/gal | **EMCoat HD:** 200 sq ft/gal

Actual coverage may vary depending on substrate porosity, surface texture, and application method.

APPLICATION TEMPERATURE: Do not apply below 50°F or when relative humidity exceeds 85%. Good ventilation, air circulation, and humidity control will improve drying time and overall application results. During periods of high humidity, fans or dehumidifiers are recommended.

THINNING: Do not thin or dilute.

APPLICATION INSTRUCTIONS: EMCoat is a high-performance, high-viscosity conductive coating that requires thorough mechanical mixing before use. Settling of the conductive components is normal. Mix with a drill and straight-vane mixing paddle until the coating reaches a uniform consistency, scraping the bottom and sides of the container as needed. Re-mix periodically during application to maintain proper dispersion.

Apply a minimum of two full coats to achieve uniform shielding coverage. Complete coverage around corners, seams, and penetrations is essential for optimum shielding performance.

Application Methods

- EMCoat S: Apply using commercial-quality airless spray equipment.
- EMCoat R & HD: Apply by roller or brush.

For larger installations, a two-person application team is recommended, with one person applying the coating while the other prepares and mixes additional material.

Spray (EMCoat S) - Do not thin the product. To avoid clogging, do not allow the coating to settle inside the hose or pump. Start pressure at approximately 50% of the equipment rating and increase as needed. Remove all filters except the main feed tube screen. Strainers and filters should be 30 mesh or larger. Use a new screen at the start of each job.

Recommended Tip Sizes

- HVLP: 2.2 mm or larger
- Airless: 417 tip or equivalent

EMCOAT PAINT - INSTALLATION GUIDELINES CONT'D

Roll (EMCoat R & EMCoat HD) - A high nap roller (3/4") will achieve the best distribution of conductive particles and ease of application. Shorter nap or microfiber rollers are not recommended.

Brush (EMCoat R & EMCoat HD) - Use a high-quality synthetic brush and apply the product liberally. When brushing or rolling, apply generous, full-bodied coats and avoid overworking the product. Watch for areas with excessive or insufficient concentrations of conductive solids to ensure uniform shielding performance.

COATS: Multiple coats will achieve the most consistent coverage and best shielding performance. Apply first coat with 50% overlap and cross coat a second coat and third coat for best results.

RECOAT TIME: Re-coat when dry to touch.

DRY TIME: Full curing is required to achieve maximum signal attenuation. See notes on application temperatures to help reduce dry times. Allow at least 24 hours before testing product. Additional time may be necessary in high humidity or low temperature conditions.

CLEAN UP: Clean immediately after use with soap and warm water. Clean all equipment according to manufacturers specifications.

DISPOSAL: Dry product can be disposed of with standard practices for paint products.

STORAGE: Store product at room temperature and do not allow to freeze. It is not recommended to store EMCoat products for longer than six months. Product must be remixed immediately prior to application.

PRECAUTIONS:

- Refer to Product Safety Data Sheet before use.
- EMCoat S is intended for interior applications. EMCoat R and EMCoat HD are suitable for interior and exterior applications.
- Do not sand.
- EMCoat is not recommended as a finished flooring surface. Floor installations should be protected with a suitable architectural finish.
- When applying EMCoat to metal substrates, non-conductive primers may interrupt the electrical connection between the substrate and the conductive coating.
- Penetrations through or connections to the shielding layer can reduce shielding effectiveness. Consult a qualified shielding professional regarding the installation of fasteners and penetrations.

GROUNDING: Grounding of conductive surfaces may be required by local electrical codes. Consult a licensed electrician to determine the appropriate grounding method for your installation.

TYPICAL PRODUCT PROPERTIES:

BASE: Water-borne Urethane	COLOR: Dark Grey
TOTAL VOC: 111 g/L	VOC: (less exempt solvents): 290g/L
DENSITY: 1452 g/L	VOLUME: .88 gal or 4.3 gal per container
SOLIDS (WT.): 54% +/- 2%	SOLIDS (VOL.): 31% +/- 2%

SURFACE RESISTIVITY INSPECTION

Inspection is a key step in the installation of any architectural shielding product. Installations should always be inspected for any cracks, seams, gaps, or other areas where the shielding product does not create continuous, uniform coverage. The conductivity of both surfaces and seams or other joining features can be tested to ensure that there is sufficient electrical continuity between sheets and other features. This can also indicate areas where products have been improperly applied, which will lead to decreased shielding performance.

The shielding effectiveness of EMCoat paint depends on even and uniform coverage over a surface that the product is applied to. Surface preparation and attention to detail are critical. In addition to proper installation and visual inspection for gaps, surface resistivity checks can help to ensure that the product has been properly applied, with consistent coverage.

With highly conductive architectural shielding product from Faraday Structures, there is a correlation between surface resistivity (measured in ohms-per-square, or ohms/sq) and shielding effectiveness (SE, measured in decibels). Highly conductive surfaces (low resistivity) offer higher shielding performance. While there are many other factors at play in a shielded room (leaks or openings, unfiltered power or data shield penetrations, etc), confirmation that the shielding materials are adequately conductive and well connected can be an indicator of a successful installation and provide confidence that they are shielding as intended. Higher surface resistivity readings (lower conductivity) can indicate flaws in the application of the shielding material. Taking surface resistivity readings throughout the installation process offers an opportunity to confirm performance or correct flaws prior to next steps in a project and full testing.

Surface Resistivity reading must be taken when the surface is fully dried. This can take between a few hours and several days, depending on installation size, temperature, humidity, and most of all circulation. Surface resistivity readings can be an indication of dryness – if the readings are no longer getting significantly lower with time, then the coating is fully dried.

Typical surface resistivity reading averages across an applied surface for a standard 2 coat application of EMCoat should be 0.6 ohm-per-square range or lower, per kelvin probe methods with an SRJ1 ohm-per-square jig (one-inch unit square) as described below. Field verification allows for an opportunity to discover areas of non-uniform application or low conductivity while it is simple to correct. The surface resistivity will go down as multiple layers of paint are added, per the chart below. A surface resistivity characterization kit can be purchased from Faraday Structures (Part Number FS-SRK1).

# OF COATS*	ACCEPTABLE SURFACE RESISTIVITY (OHM/SQUARE)**
1	0.08 or lower
2	0.06 or lower
3	0.05 or lower

* it is recommended in all installation that an initial coat consisting of a light surface prep “prime” coat be applied to the surface before any full, uniform coating layers. Additional coats do not require a prep coat. See installation recommendations for more details.

** as installed by approved methods, fully dried, and before overcoating or sealants. With FS-SRK1 surface resistivity jig used in a four wire Kelvin probe configuration. Readings below range are acceptable.

SURFACE RESISTIVITY READING METHOD

All of the benefits of surface resistivity testing described above can be obtained through a few easy steps. Surface resistivity is measured in ohms/square (Ω/sq), which is a measurement of the resistance (Ω) over a given distance, normalized throughout an equivalent length section of the material being tested. Milli-ohm meters and the 4-point square jig required to test the surface resistivity can be obtained through Faraday Structures.

1. Adjust the sensitivity reading on the milliohm meter to the 2Ω setting or lower. This will adjust the decimal placement so that you can see the significant figures required for effective testing.
2. Place the jig on the surface being measured and apply consistent pressure until a stable reading is observed. Rotate the jig slightly to ensure good contact and to check for directionality.
3. Take measurements in all critical areas, such as seams or connection points for penetrations.
4. Take additional measurements at regular intervals on all surfaces (for example, 1 reading per square foot or square meter, depending upon the scale of your project).
5. Document each reading and average the results. If you find isolated spots with inconsistent or high readings, these are the areas that can be addressed by applying supplemental coating over affected areas.

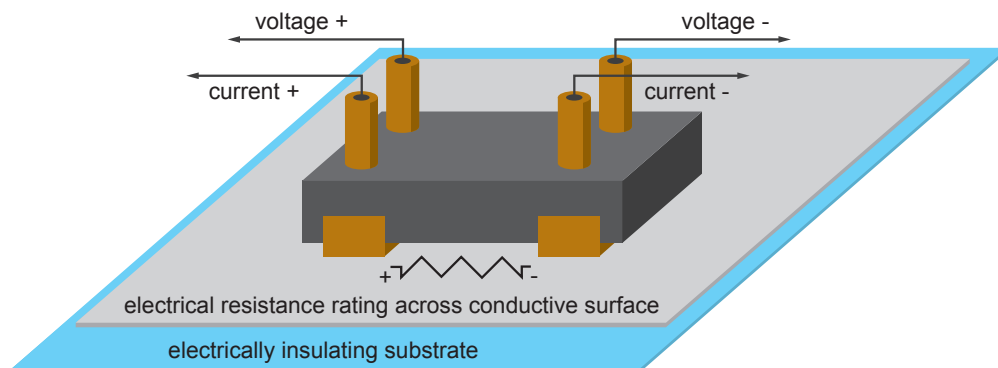


FIGURE 2: Surface Resistivity Testing with Jig (SRJ1)



Surface Resistivity
Jig (SRJ1)



Milli-ohm meter with four
point Kelvin probe surface
resistivity configuration



Apply pressure until reading
stabilizes. The jig can be
rotated in plane to check
for directionality

SDS-004 EMCoat Paint SAFETY DATA SHEET

Section 1: Identification

Product Name EMCoat Waterborne Conductive Paint
Product Code 4PA067
Manufacturer Faraday Structures (a division of the Conductive Group)
 375 West 910 South
 Heber City, Utah 84032
info@conductive.com
Telephone (General) +1 (435) 654-3683

Section 2: Hazard(s) Identification

Classification of the Substance or Mixture:

Carcinogenicity – Category 2 (based on polymer base chemistry)
 Toxic to Reproduction (Unborn child) – Category 1B

GHS Label Elements:

Hazard Pictogram:



GHS08: Health Hazard

Signal Word: Danger
Hazard Statement: May damage unborn child
 Suspected of causing cancer

Precautionary statements:

General: Read label before use.
Prevention: Use proper “personal protective equipment” (PPE); gloves, eye and face protection, protective clothing. Do not breathe vapor.
Response: If you feel unwell following exposure seek medical attention.
Storage: Store in dry location at temperatures between 50 °F – 90 °F (10 °C – 33 °C).
Disposal: Dispose of contents and container in accordance with all local, regional, national, and international regulations.

Supplemental label elements: This product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. Please carefully review the contents of the Safety Data Sheet for additional information.

Hazards not otherwise classified: None known.

Section 3: Composition/Information on Ingredients

Substance / mixture: Mixture.

Ingredient Name	Typical Composition	C.A.S. Number	EINECS Number
Nickel (Ni)	0-50 %	7440-02-0	2311114
1-Methoxy-2-propanol	<2.0	107-98-2	
2-Methoxymethylethoxypropanol	<2.0	34590-94-8	
Propylene Glycol	<2.0	57-55-6	
1-Methyl-2-Pyrrolidone	<2.0	872-50-4	
1,2,4-Trimethylbenzene	<2.0	95-63-6	
Cumene	<0.5	98-82-8	

Based on product and formula knowledge of the manufacturer there are no additional ingredients present which are classified as hazardous to health and thereby are not required to be reported in this section.

SDS-004 EMCoat Paint SAFETY DATA SHEET**Section 4: First-Aid Measures**

- INHALATION:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. Qualified personnel may give oxygen if breathing is difficult. Seek medical attention.
- INGESTION:** Rinse mouth with water. Do not induce vomiting. Seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.
- SKIN:** Remove contaminated clothing, wash affected area with soap and warm water. To avoid further irritation, do not rub or scratch the irritated areas. Seek medical attention if symptoms develop or persist.
- EYES:** Immediately flush eyes with lukewarm water, including under eyelids, for at least 15 minutes. Seek medical attention.
- MOST IMPORTANT SYMPTOMS/EFFECTS, ACUTE AND DELAYED:** May cause skin irritation. See section 11 for more information.
- INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT IF NECESSARY:** In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Section 5: Fire-Fighting Measures

- FLAMMABILITY OF THE PRODUCT:** No specific fire or explosion hazard.
- EXTINGUISHING MEDIA:** Use extinguishing agent suitable for surrounding material and type of fire.
- UNSUITABLE EXTINGUISHING MEDIA:** No information available.
- SPECIFIC HAZARDS ARISING FROM THE MATERIAL:** May emit toxic metal oxide fumes under fire conditions.
- SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS:** Use full face, self-contained breathing apparatus and full protective clothing when necessary.

Section 6: Accidental Release Measures

- PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, AND EMERGENCY PROCEDURES:** Avoid contact with skin, eyes, or clothing. Wear appropriate NIOSH-approved respirators if collection and disposal of dust is likely. Clean up material and put into a suitable container and dispose in accordance with applicable regulations.

Section 7: Handling and Storage**PRECAUTIONS FOR SAFE HANDLING:**

PROTECTIVE MEASURES: Wear appropriate personal protective equipment (see Section 8). Avoid exposure to the liquid material during pregnancy. Do not allow contact with eyes or mucous membranes. The dry form of this material contains fibers and is electrically conductive. User generated airborne particulates are electrically conductive and may create electrical short circuits that could result in damage to and malfunction of electrical equipment and/or personal injury.

Store in the original supplied container, with the lid firmly closed, when not in use. Do not store near acids. Store at temperatures between 50 °F – 90 °F (10 °C – 33 °C).

SDS-004 EMCoat Paint SAFETY DATA SHEET

If ventilation alone cannot control exposure to vapor and dust, use respirators approved for the purpose.

Avoid repeated or continuous skin contact. Wear suitable disposable gloves. Wash skin thoroughly after handling.

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored, applied, or processed. After exposure to the material, workers should wash hands and face before eating, drinking, or smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on other hygiene measures.

Section 8: Exposure Controls/Personal Protection

1-Methoxy-2-propanol	ACGIH TLV (United States, 3/2016)
	TWA: 50 ppm 8 hours.
	TWA: 184 mg/m ³ 8 hours.
	STEL: 100 ppm 15 minutes.
	STEL: 369 mg/m ³ 15 minutes.
2-Methoxymethylethoxypropanol	ACGIH TLV (United States, 3/2016)
Absorbed through skin.	TWA: 100 ppm 8 hours.
	TWA: 606 mg/m ³ 8 hours.
	STEL: 150 ppm 15 minutes.
	STEL: 909 mg/m ³ 15 minutes.
Absorbed through skin.	OSHA PEL (United States, 6/2016)
	TWA: 100 ppm 8 hours.
	TWA: 600 mg/m ³ 8 hours.
Propylene Glycol	AIHA WEEL (United States, 10/2011)
	TWA: 10 mg/m ³ 8 hours.
1-Methyl-2-Pyrrolidone	AIHA WEEL (United States, 10/2011)
Absorbed through skin.	TWA: 10 ppm 8 hours.
1,2,4-Trimethylbenzene	ACGIH TLV (United States, 3/2016)
	TWA: 25 ppm 8 hours.
	TWA: 123 mg/m ³ 8 hours.
Cumene	ACGIH TLV (United States, 3/2016)
Absorbed through skin.	TWA: 50 ppm 8 hours.
	TWA: 245 mg/m ³ 8 hours.

EYE/FACE PROTECTION: Avoid eye contact. Wear coverall goggles, as necessary.

SDS-004 EMCoat Paint SAFETY DATA SHEET

SKIN PROTECTION: Wear chemical resistant, impervious, disposable gloves to protect hands. Wear protective clothing such as a loose fitting long sleeved shirt that covers the arms and neck, long pants, and shoes that cover the entire foot.

RESPIRATORY PROTECTION: Not ordinarily required. If sufficient vapor or fumes are generated during application, use a NIOSH approved organic vapor respirator or a nuisance dust mask.

VENTILATION: Use local exhaust sufficient to control vapor, particulates, or dust, to below acceptable exposure limits. If exhaust ventilation is not available or is inadequate, use a NIOSH approved respirator, as appropriate. Discharge from the ventilation system should comply with applicable air pollution control regulations. Electrical systems, in areas where the product is handled, must be suitable for operation in an environment containing electrically conductive dust, fibers or particulate.

GENERAL HYGIENE RECOMMENDATIONS: Before eating, drinking, smoking, or using toilet facilities, wash face and hands thoroughly with soap and water. Use vacuum equipment to remove dry product, dust, fibers, or particulate from clothing and work areas. Use of compressed air is not recommended.

Section 9: Physical and Chemical Properties

Physical state:	Liquid
Color:	Light to medium gray when liquid. Off-white to light gray when dry.
Odor:	Not available
pH:	< 8.5
Viscosity:	N/A
Melting point Ni	1453 °C
Melting point of coating:	n/a
Boiling point Ni	2732 °C
Boiling point of coating	100 °C
Flash Point	Closed cup: >93.3 °C (>199.9 °F)
Evaporation Rate:	<0.8 (butyl acetate = 1)
Flammability:	n/a
Auto-ignition temperature:	n/a
Decomposition temperature:	n/a
Lower explosive limit:	~1.1 %
Upper explosive limit:	~14 %
Vapor pressure:	2.3 kPa (at 20 °C)
Vapor density:	1
Relative density:	n/a
Solubility	n/a
Partition coefficient:	n/a
Viscosity:	not determined
Molecular weight:	not determined

SDS-004 EMCoat Paint SAFETY DATA SHEET**Section 10: Stability and Reactivity**

Reactivity: This product is stable.

Chemical Stability: This product is stable, however, the nickel present in the formula may react vigorously with acids to liberate hydrogen which can form explosive mixtures with air.

Possibility of Hazardous Reactions: Under normal conditions of storage and use, no hazardous reactions are anticipated.

Conditions to Avoid: Under special conditions the nickel present in this formula can react with carbon monoxide in reducing atmospheres to form nickel carbonyl, $\text{Ni}(\text{CO})_4$, a toxic gas. This is a very unlikely possibility.

Hazardous Decomposition: The products of combustion and decomposition depend on other materials present in the fire and the actual conditions of the fire. Burning will produce oxides and other unidentified gases and vapors that may be toxic. Avoid inhalation of decomposition products.

Section 11: Toxicological Information

Nickel LD50 ORAL RAT >9000 mg/kg

Evidence for the association of nickel compound exposures and cancer risk comes mainly from workers in now obsolete nickel refining operations where very high concentrations of airborne nickel, mostly present as oxidic or sub-sulphidic species at up to 100 mg/m³ or more, were associated with excess nasal and lung cancers. The inhalation of nickel powder has not resulted in an increased incidence of malignant lung tumors in rodents. Repeated intratracheal instillation of nickel powder produced an increased incidence of malignant lung tumors in rats. Repeated intratracheal instillation of nickel powder did not produce an increased incidence of malignant lung tumors in hamsters when administered at the maximum tolerated dose. Single intratracheal instillations of nickel powder in hamsters at doses near the LD50 produced an increased incidence of fibrosarcomas, mesotheliomas and rhabdomyosarcomas. Inhalation of nickel powder at concentrations 15 times the TLV irritated the respiratory tract in rodents.

Animal experiments indicate that soluble nickel ingestion causes adverse effects on fetal development at a threshold oral exposure of 2.2 mg/ Ni/kg/day by pregnant rats. Data are insufficient to determine if this effect occurs in humans and no regulatory agency has classified soluble forms of nickel as reproductive risks for humans. No soluble nickel is found in this product as formulated.

Section 12: Ecological Information

No ecological data has been determined on the total product.

Section 13: Disposal Considerations

Material for disposal should be placed in appropriate sealed containers to avoid potential human and environmental exposure. It is the responsibility of the generator to comply with all federal, state, and local laws and regulations. We recommend that you contact an appropriate waste disposal contractor and environmental agency for relevant laws and regulations. Under the U.S., Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets relevant waste classification and to assure proper disposal.

Nickel-containing waste can be collected to recover nickel values. Should nickel recovery be implemented, follow EPA and local regulations.

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The generation of waste should be minimized or avoided wherever possible.

Section 14: Transport Information

International Maritime Dangerous Goods Code

Not regulated.

International Civil Aviation Organization Technical Instructions for the Carriage of Dangerous Goods by Air

Not regulated.

U.S. Dept. of Transportation Regulations

Not regulated.

Canadian Transportation of Dangerous Goods Act

Not regulated.

European Agreement Concerning the International Carriage of Dangerous Goods by Road

Not regulated.

Section 15: Regulatory Information

TSCA Listed: Nickel is listed on the TSCA inventory.

HMIS Ratings: Health: 1 Flammability: 1 Physical: 0

SARA Title III: This product contains metallic nickel which is subject to the reporting requirements of SARA Title III Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372:

California Prop. 65: This product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. As indicated in Title 22 of the California Code of Regulations Section 12707(b)(5), for purposes of Proposition 65, nickel and nickel compounds present no significant risk of cancer by the route of ingestion.

Refer to the Composition section (Section 3) of this SDS for appropriate CAS numbers and percent by weight.

Section 16: Other Information

Explanation and Disclaimer: Wherever such words or phrases as "hazardous," "toxic," "carcinogen," etc. appear herein, they are used as defined or described under state employee right-to-know laws, Federal OSHA laws or the direct sources for these laws such as the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), etc. The use of such words or phrases should not be taken to mean that we deem or imply any substance or exposure to be toxic, hazardous or otherwise harmful. Any exposure can only be understood within the entire context of its occurrence, which includes such factors as the substance's characteristics as defined in the SDS, amount and duration of exposures, other chemicals present and preexisting individual differences in response to the exposure.

The data provided in this SDS is based on the information received from our raw material suppliers and other sources believed to be reliable. We are supplying you this data solely in compliance with the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200 and other Federal and state laws as described in Section 15: Regulatory Information. This SDS and the information in it are not to be used for purposes other than compliance with the Federal OSHA Hazard Communication Standard.

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SDS-004 5/4/22

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Revision History		
Revision	Effective Date	Summary of Changes
0	2/19/2018	Initial version
1	5/4/2022	Branding Updates
2	6/4/2026	Product Updates
3	7/29/2026	Product Updates - EmCoat R & HD