

November 2009



TECHNICAL BULLETIN:

Colloidal Silver Shaft Coating PN: CS015

Application: Used to enhance shaft surface conductivity for use with AEGIS Bearing Protection Ring Technology

Background: Maintaining a conductive shaft surface is required to allow efficient discharge of VFD induced shaft voltage to the AEGIS Bearing Protection Ring micro fibers (also known as the AEGIS Shaft Grounding Ring). Our AEGIS micro fiber shaft grounding technology was designed to discharge voltages by applying a circumferential ring of conductive micro fibers directly to the steel shaft surface in VFD driven electric motors.



Shaft surface conductivity: Improving the conductivity of the steel shaft surface enhances the shaft voltage discharge capability in AEGIS shaft grounding applications. Maintaining a highly conductive shaft surface is especially important in critical applications or in applications where the conductive shaft surface of steel could become compromised. Environmental elements could create a potential for decreased conductivity on the shaft of the motor.

Test results: Applying Colloidal Silver Shaft Coating to the shaft surface before AEGIS is installed significantly increased the surface conductivity of the shaft and decreased the residual voltage level measured on the shaft. The Colloidal Silver Shaft Coating increases the conductivity between the motor shaft and the AEGIS conductive microfibers.

Recommendation: Apply AEGIS CS015 Colloidal Silver Shaft Coating to any VFD driven motor shaft prior to installing AEGIS Bearing Protection Ring™. Treating the shaft of the motor prior to installing AEGIS shaft grounding ring technology is a low cost performance enhancement option.



AEGIS SGR™ Prevents Electrical Bearing Damage

Application Notes for Part Number CS015:

- Thoroughly stir the silver coating.
- Shaft must be clean & free of any coatings, paint, or other nonconductive material. The shaft must be clean to bare metal. Depending on the condition of the shaft, it may require using emery cloth or Scotch-Brite. If the shaft is visibly clean, a non petroleum based solvent may be used to remove any residue. If possible, check the conductivity of the shaft using an ohms meter.
 - Ohms test: Place the positive and negative meter leads on the shaft at a place where the microfibers will contact the shaft. Each motor will have a different reading but in general you should have a maximum reading of 2 ohms. If the reading is higher, clean the shaft again and retest.
- Apply a light coat of the AEGIS Colloidal Silver Shaft Coating to the area where the AEGIS microfibers are in contact with the motor shaft. Apply evenly all around the shaft.
- Allow to dry before installing the AEGIS Shaft Grounding Ring. Coating will cure at room temperature in 16-20 hours or in 30 minutes at 120-200°C. A heat gun will cure the materials in seconds.

Shelf Life: 6 months; material should be jar rolled at 1-6 rev/hr. Avoid exposure to extreme temperatures.

Storage: Store in a dry location at 5-30°C. Allow paint to come to room temperature prior to opening.

Refer to the Material Safety Data Sheet for additional information.

Best regards,

Adam Willwerth
AEGIS Sales/Marketing Manager



AEGIS SGR™ Prevents Electrical Bearing Damage



Material Safety Data Sheet:

Colloidal Silver Shaft Coating
Issue Date (03-13-07)
Review Date (03-22-07)

Product Number: CS015

Section 1: Product and Company Identification

Product Name: Colloidal Silver Shaft Coating
Manufactured for: Electro Static Technology-ITW, 31 Winterbrook Road, Mechanic Falls, ME 04256
Ph: 207-998-5140 Fx: 207-998-5143 www.est-aegis.com
Chemtrec Emergency Number 1-800-424-9300 24 hrs a day.

Section 2: Composition / Information on Ingredients

Principle Hazardous Component(s) (chemical and common name(s)) (Cas. No)	%	OSHA PEL mg/m ³	ACGIH TLV mg/m ³	NTP	IARC	OSHA regulated
Silver (7440-22-4)*	~60	0.01	0.1	No	No	No
Arcosolve PM (107-98-2)		100 PPM	ND	No	No	No
Toluene (108-88-3)	≤ 10	100 PPM	ND	No	3	No
Ethanol (64-17-5)		1000 PPM	ND	No	No	No
Ethyl Acetate (141-78-6)	≤ 4	400 PPM	ND	No	No	No

*NIOSH IDLH: 10 mg/m³ (as Ag) 0.1 mg/m³

Section 3: Hazard Identification

Emergency overview

Appearance: Gray liquid or paste
Immediate effects: Flammable material. Caution! May cause skin irritation.

Potential health effects

Primary routes of entry: Inhalation, ingestion, skin, and eye contact.
Signs and Symptoms of Overexposure: ND
Eyes: May cause eye irritation.
Skin: May cause skin irritation.
Ingestion: NIF
Inhalation: NIF
Chronic Exposure: NIF
Chemical Listed As Carcinogen or Potential Carcinogen: No
See Toxicological Information (Section 11)

Potential environmental effects

See Ecological Information (Section 12)

Section 4: First Aid Measures

If accidental overexposure is suspected

Eye(s) Contact: Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

Skin Contact: Wash area thoroughly with soap and water. Get medical aid if irritation develops or persists.

Inhalation: Remove from exposure to fresh air immediately. Get medical aid if cough or other symptoms appear.

Ingestion: Do not induce vomiting. Never give anything by mouth to an unconscious person. If victim is conscious and alert, give 2-4 cups full of milk or water. Get medical aid.

Note to physician

Treatment: ND

Medical Conditions generally Aggravated by Exposure: ND

Section 5: Fire Fighting Measures

Flash Point: 24° F (Ethyl Acetate).

Flammable Limits: ND

Auto-ignition point: ND

Fire Extinguishing Media: Carbon dioxide, foam, dry chemical, water

Special Fire Fighting Procedures: As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective gear.

Unusual Fire and Explosion Hazards: Can burn in fire, releasing toxic vapors. Vaporized easily at normal temperatures.

Hazardous combustion products: Forms carbon dioxide and carbon monoxide.

DOT Class: Flammable

Section 6: Accidental Release Measures

Steps to be Taken in Case Material is Released or Spilled: Wear protective equipment. For an uncontrolled release of this product to the environment, take immediate steps to stop and contain release. Notify local authorities, if required. Clean up with rags or paper and place in container for refining.

Waste Disposal Methods: Dispose of waste according to Federal, State and Local Regulations.

Section 7: Handling and Storage

Precautions to be Taken in Handling and Storage: Used with adequate ventilation. Avoid contact with skin and eyes. Wash thoroughly after handling. Keep container closed when not in use.

Storage temperature: Store at ambient or lower temperature.

Storage Pressure: NA

Section 8: Exposure Controls / Personal Protection

Engineering Controls

Ventilation required: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection Equipment

Respiratory protection: Good general ventilation should be sufficient to control airborne levels. A NIOSH approved dust/mist respirator is recommended when TLV levels are exceeded.

Protective gloves: Use appropriate chemical gloves when handling.

Skin protection: Use appropriate protective clothing, gloves and shoes.

Eye protection: Wear chemical safety glasses with side shields or face shield

Additional clothing and/or equipment: Eye wash facilities available where eye contact can occur.

Exposure Guidelines

See Composition/Information on Ingredients (Section2)

Section 9 Physical and Chemical Properties

Appearance and Physical State: Grey paste liquid.

Odor (threshold): Strong odor

Specific Gravity (H₂O=1): ND

Vapor Pressure (mm Hg): ND

Vapor Density (air=1): ND

Percent Volatile by volume: ND

Evaporation Rate (butyl acetate=1): ND

Boiling Point: 167° F

Freezing point / melting point: ND

pH: NA

Solubility in Water: ND

Molecular Weight: NA

Section 10: Stability and Reactivity

Stability: Stable under normal conditions of use. Keep cap tight.

Conditions to Avoid: Incompatible materials

Materials to Avoid (Incompatibility): Strong oxidizers, acids and alkali.

Hazardous Decomposition Products: Carbon dioxide and carbon monoxide

Hazardous Polymerization: Will not occur.

Section 11: Toxicological Information

Results of component toxicity test performed: ND

Human experience: ND

This product **does not** contain any compounds listed by NTP or IARC or regulated by OSHA as a carcinogen.

Section 12: Ecological Information

Ecological Information: Ecological data are not available. Material should be treated as harmful to aquatic organisms.

Chemical Fate Information: ND

Section 13 Disposal Considerations

RCRA 40 CFR 261 Classification: Can be recycled to recover precious metal.

Federal, State and local laws governing disposal of materials can differ. Ensure proper disposal compliance with proper authorities before disposal.

Section 14: Transportation Information

US DOT Information: Proper shipping name: Flammable liquid, n.o.s. (1-Methoxy-2-Propanol, Toluene)

Hazard Class: 3

Packaging group: III

UN Number: UN1993

IATA: Proper shipping name: Flammable liquid, n.o.s. (1-Methoxy-2-Propanol, Toluene)

Hazard Class: 3

Packing group: III
UN Number: UN1993

IMO: Proper shipping name: Flammable liquid, n.o.s. (1-Methoxy-2-Propanol, Toluene)

Class: 3

UN Number: UN1993

Packing group: III

Marine Pollutant: No

Canadian TDG: Flammable liquid, n.o.s. (1-Methoxy-2-Propanol, Toluene)

Section 15: Regulatory Information

United States Federal Regulations

MSDS complies with OSHA's Hazard Communication Rule 29, CFR 1910.1200.

SARA:

SARA Title III: Following ingredients of this product are listed in SARA 313: Toluene: CAS# 108-88-3, 10% Maximum Ethyl Acetate: CAS# 141-78-6, 4% Maximum.

Silver: CAS# 7440-22-4, 60% Maximum.

RCRA: ND

TSCA: All components of this product are listed on the TSCA Inventory.

CERCLA: Toluene: RQ = 1000 lbs (45.4 Kg), Silver: RQ = 1000 lbs (45.4 Kg), Ethyl Acetate: RQ = 5000 lbs (2270 Kg)

State Regulations

California Proposition 65: Contains Toluene and Ethanol. These chemicals are known to the State of California to cause birth defects or other reproductive harm.

International Regulations

Canada WHMIS: ND

Europe EINECS Numbers: ND

Section 16: Other Information

Label Information: ND

European Risk and Safety Phrases: ND

European symbols needed: ND

Canadian WHMIS Symbols: ND

Hazard Rating HMIS®: Health: **2**; Fire: **3**; Reactivity: **0**; Personal Protection Equip.: **B**

NFPA Ratings: ND

(0=least, 1=Slight, 2=Moderate, 3=High, 4=Extreme)

Abbreviations used in this document

NE= Not established

NA= Not applicable

NIF= No Information Found

ND= No Data

Disclaimer

Electro Static Technology-ITW makes no warranty of any kind regarding the information furnished herein. Users should independently determine the suitability and completeness of information from all sources. While this data is presented in good faith and believed to be accurate, it should be considered only as a supplement to other information gathered by the user. It is the User's responsibility to assure the proper use and disposal of these materials as well as the safety and health of all personnel who may work with or otherwise come in contact with these materials.