

MATERIAL SAFETY DATA SHEET

MSDS DATE:07/30/07

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: CONDUCTIVE SILVER PEN
SYNONYMS: CONDUCTIVE SILVER PEN
PRODUCT CODES: 12644-01

MANUFACTURER: ELECTRON MICROSCOPY SCIENCES
DIVISION: 1560 INDUSTRY ROAD/P.O. BOX 550
ADDRESS: HATFIELD, PA 19440

EMERGENCY PHONE: 215-412-8400
CHEMTREC PHONE: 800-424 -4300

FAX PHONE: 215-412-8450

CHEMICAL NAME: N/A
CHEMICAL FAMILY: N/A

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT:

SILVER
n-BUTYL ACETATE
POLYMER, PROPRIETARY

<u>CAS NO.</u>	<u>% WT</u>	<u>% VOL</u>	<u>SARA 313 REPORTABLE</u>
7440-22-4	45-55	N/A	
123-86-4	35-45	N/A	
	<20	N/A	
	<u>ppm</u>	<u>mg/m3</u>	
OSHA PEL-TWA:	N/A	N/A	
OSHA PEL STEL :	N/A	N/A	
OSHA PEL CEILING:	N/A	N/A	
ACGIH TLV-TWA:	N/A	N/A	
ACGIH TLV STEL:	N/A	N/A	
ACGIH TLV CEILING:	N/A	N/A	

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

ROUTES OF ENTRY: N/A

POTENTIAL HEALTH EFFECTS

EYES: AVOID CONTACT WITH EYES; MAY CAUSE REDNESS, IRRITATION AND CONJUNCTIVITIS.

SKIN: PROLONGED OR REPEATED EXPOSURE MAY CAUSE SKIN IRRITATION

INGESTION:INGESTION OF LARGE AMOUNTS MAY PRODUCE ABDOMINAL PAIN, NAUSEA AND VOMITING. SWALLOWING SMALL AMOUNTS IS NOT LIKELY TO PRODUCE HARMFUL EFFECTS

INHALATION: PROLONGED OR EXCESSIVE INHALATION MAY CAUSE RESPIRATORY TRACT IRRITATION. HIGH CONCENTRATIONS MAY LEAD TO CENTRAL NERVOUS SYSTEM EFFECTS (DROWSINESS, DIZZINESS, NAUSEA, HEADACHES, PARALYSIS AND LOSS OF CONSCIOUSNESS.

ACUTE HEALTH HAZARDS: LOW HAZARD FOR USUAL INDUSTRIAL OR COMMERCIAL HANDLING

CHRONIC HEALTH HAZARDS: PROLONGED OR REPEATED OVEREXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM, KIDNEY, LIVER, AND LUNG DAMAGE

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: N/A

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CARCINOGENICITY

OSHA: N/A

ACGIH: N/A

NTP: N/A

IARC: N/A

OTHER: N/A

SECTION 4: FIRST AID MEASURES

EYES: FLUSH WITH WATER FOR 15 MINUTES IF IRRITATION OCCURS. SEEK MEDICAL ATTENTION

SKIN: WASH WITH SOAP AND WATER. IF IRRITATION OCCURS. SEEK MEDICAL ATTENTION.

INGESTION: FOR LARGE AMOUNTS; ASPIRATION HAZARD. IF SWALLOWED, VOMITING MAY OCCUR SPONTANEOUSLY, BUT DO NOT INDUCE. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION INTO LUNGS. CALL A PHYSICIAN IMMEDIATELY

INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION OR GIVE OXYGEN BY TRAINED PERSONNEL. SEEK IMMEDIATE MEDICAL ATTENTION.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS: N/A

SECTION 5: FIRE-FIGHTING MEASURES

FLAMMABLE LIMITS IN AIR, UPPER: 7.6
(% BY VOLUME) **LOWER:** 1.7

FLASH POINT:

F: N/A

C: > 22 DEG

METHOD USED: TAG CC

AUTOIGNITION TEMPERATURE:

F: N/A

C: > 425 DEG

NFPA HAZARD CLASSIFICATION

HEALTH: N/A

FLAMMABILITY: N/A

REACTIVITY: N/A

OTHER: N/A

HMS HAZARD CLASSIFICATION

HEALTH: N/A

FLAMMABILITY: N/A

REACTIVITY: N/A

PROTECTION: N/A

EXTINGUISHING MEDIA: USE ALCOHOL FOAM, CARBON DIOXIDE, OR WATER SPRAY WHEN FIGHTING FIRES INVOLVING THIS MATERIAL

SPECIAL FIRE FIGHTING PROCEDURES: EVACUATE AREA AND FIGHT FIRE FROM A SAFE DISTANCE. WEAR SELF CONTAINED BREATHING APPARATUS PRESSURE-DEMAND, (OSHA/NIOSH APPROVED OR EQUIVALENT) AND FULL PROTECTIVE GEAR

UNUSUAL FIRE AND EXPLOSION HAZARDS: N/A

HAZARDOUS DECOMPOSITION PRODUCTS: VAPORS CAN TRAVEL TO A SOURCE OF IGNITION AND FLASH BACK

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES:

SMALL SPILL: CONTAIN SPILL WITH DIKE TO PREVENT ENTRY INTO SEWERS

LARGE SPILL: CLEAN UP SPILLS IMMEDIATELY, OBSERVING PRECAUTIONS IN PROTECTIVE EQUIPMENT SECTION.

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GENERAL PROCEDURES: DIKE AREA TO CONTAIN SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT CONTAMINATION OF GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIAL ON ADSORBENT, SUCH AS SAWDUST OR VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING VAPORS, HAVE BEEN REMOVED THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO SEWER. IF AREA OF SPILL IS POROUS, REMOVE AS MUCH CONTAMINATED EARTH, GRAVEL, ETC. AS NECESSARY AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.

SPECIAL PROTECTIVE EQUIPMENT: ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN/ EYE PROTECTION SHOULD BE PERMITTED IN AREA. SEE SECTION 8 FOR DETAILS

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE: USE WITH SUFFICIENT VENTILATION TO KEEP EMPLOYEE EXPOSURE BELOW RECOMMENDED LIMITS. PROVIDE ADEQUATE VENTILATION FOR STORAGE, HANDLING AND USE, ESPECIALLY FOR ENCLOSED OR LOW SPACES. AVOID CONTACT OF LIQUID WITH EYES AND PROLONGED SKIN EXPOSURE. DO NOT ALLOW PRODUCT TO CONTACT OPEN FLAME OR ELECTRICAL HEATING ELEMENTS BECAUSE DANGEROUS DECOMPOSITION PRODUCTS MAY FORM. STORE AWAY FROM HEAT. STORE AT LOCAL ATMOSPHERIC PRESSURE. STORE IN A COOL PLACE BELOW (120) F (49) C

OTHER PRECAUTIONS: WASH THOROUGHLY AFTER HANDLING. USE ONLY IN A WELL VENTILATED AREA. STORE IN A COOL DRY PLACE.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS.

VENTILATION: LOCAL EXHAUST VENTILATION.

RESPIRATORY PROTECTION: NIOSH/OSHA APPROVED AIR PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE OR CANISTER MAY BE PERMISSIBLE UNDER CERTAIN CIRCUMSTANCES WHERE AIRBORNE CONCENTRATIONS ARE EXPECTED TO EXCEED EXPOSURE LIMITS. PROTECTION PROVIDED BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE AIR SUPPLIED RESPIRATOR IF THERE IS AND POTENTIAL FOR UNCONTROLLED RELEASE, EXPOSURE LEVELS ARE NOT KNOWN, OR ANY OTHER CIRCUMSTANCES WHERE AIR PURIFYING RESPIRATORS MAY NOT PROVIDE ADEQUATE PROTECTION.

EYE PROTECTION: FOR NORMAL CONDITIONS, WEAR SAFETY GLASSES. WHERE THERE IS REASONABLE PROBABILITY OF LIQUID CONTACT, WEAR SPLASH-PROOF GOGGLES

SKIN PROTECTION: THE GLOVES LISTED BELOW MAY PROVIDE PROTECTION AGAINST PERMEATION. GLOVES OF OTHER CHEMICALLY VITON, SOLVEX, BUTYL, BUNA, NEOPRENE.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: N/A

WORK HYGIENIC PRACTICES: WASH THOROUGHLY AFTER HANDLING, AND BEFORE EATING. WASH CLOTHING BEFORE REUSE.

EXPOSURE GUIDELINES:EMERGENCY SHOWER AND EYEWASH FACILITY SHOULD BE IN CLOSE PROXIMITY.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: SILVER LIQUID

ODOR: SWEET ESTER ODOR

PHYSICAL STATE: LIQUID

pH AS SUPPLIED: N/A

pH (Other): N/A

BOILING POINT:

F: N/A

C: > 126 DEG

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MELTING POINT: N/A

F: N/A

C: N/A

FREEZING POINT: N/A

F: N/A

C: N/A

VAPOR PRESSURE (mmHg): N/A

@

F: N/A

C: N/A

VAPOR DENSITY (AIR = 1): >1

@

F: N/A

C: N/A

@

F: N/A

C: N/A

EVAPORATION RATE: N/A

BASIS (=1): N/A

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES (con't)

SOLUBILITY IN WATER: INSOLUBLE

PERCENT SOLIDS BY WEIGHT: N/A

PERCENT VOLATILE: 30
BY WT/ BY VOL @

F: N/A

C: N/A

VOLATILE ORGANIC COMPOUNDS (VOC): N/A

WITH WATER: N/A	LBS/GAL
WITHOUT WATER: N/A	LBS/GAL

MOLECULAR WEIGHT: N/A

VISCOSITY: N/A

@

F: N/A

C: N/A

SECTION 10: STABILITY AND REACTIVITY

STABILITY: STABLE

CONDITIONS TO AVOID (STABILITY): HEAT, FLAMES, IGNITION SOURCES, AND INCOMPATIBLES

INCOMPATIBILITY (MATERIAL TO AVOID): STRONG ACIDS AND ALKALIS, REACTIVE METALS AND STRONG OXIDIZING AGENTS

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: CARBON DIOXIDE AND CARBON MONOXIDE MAY FORM WHEN HEATED TO DECOMPOSITION.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID (POLYMERIZATION): N/A

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:

ACUTE:

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DERMAL LD₅₀ : > 5 G/KG (RABBIT)

ORAL LD₅₀ : 13100 MG/KG (RAT)

INHALATION LC₅₀: 2000 PPM, 4-HOUR

FUMES/LIQUID-- IRRITANT

EYE EFFECTS: MIXTURE IS A MODERATE EYE IRRITANT

MUTAGENICITY: COLLECTIVE DATA INDICATE NON-MUTAGENIC

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:

ENVIRONMENTAL DATA: THERE IS LIMITED INFORMATION AVAILABLE ON THE ENVIRONMENTAL FATE AND EFFECTS OF THIS MATERIAL. THE PRIMARY ENVIRONMENTAL CONCERN FOR RELEASE IS THE IMPACT ON AQUATIC AND TERRESTRIAL SPECIES. DUE CARE SHOULD BE TAKEN TO AVOID THE ACCIDENTAL RELEASE OF THIS MATERIAL INTO THE ENVIRONMENT

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: COMPLY WITH FEDERAL, STATE, LOCAL REGULATIONS.

RCRA HAZARD CLASS: N/A

SECTION 13: DISPOSAL CONSIDERATIONS (con't)

FOR LARGE SPILLS: CONTAMINATED SAWDUST, VERMICULITE, OR POROUS SURFACES MUST BE DISPOSED OF IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. RECOVERED LIQUIDS MAY BE REPROCESSED OR INCINERATED OR MUST BE TREATED IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION

PROPER SHIPPING NAME: NON-HAZARDOUS

HAZARD CLASS: 3.2

ID NUMBER: UN1993

PACKING GROUP: II

LABEL STATEMENT: " THIS PACKAGE CONFORMS TO 49 CFT 173.4"

WATER TRANSPORTATION

PROPER SHIPPING NAME:

HAZARD CLASS: SAME

ID NUMBER:

PACKING GROUP:

LABEL STATEMENTS:

AIR TRANSPORTATION

PROPER SHIPPING NAME:

HAZARD CLASS: SAME

ID NUMBER:

PACKING GROUP:

LABEL STATEMENTS:

OTHER AGENCIES: N/A

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA (TOXIC SUBSTANCE CONTROL ACT): ALL COMPONENTS OF THIS PRODUCT ARE EITHER LISTED OR EXEMPT FROM LISTING IN THE TSCA INVENTORY

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT):

CERCLA REGULATORY: N-BUTYL ACETATE (CAS # 123-86-4)

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CERCLA RG: 5000 LBS

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT): NOT LISTED AS AN EXTREMELY HAZARDOUS SUBSTANCE

311/312 HAZARD CATEGORIES: IMMEDIATE/ DELAYED

313 REPORTABLE INGREDIENTS: NOT CONSIDERED A SARA 313 "TOXIC CHEMICAL"

STATE REGULATIONS: N/A

INTERNATIONAL REGULATIONS: N/A

SECTION 16: OTHER INFORMATION

OTHER INFORMATION:N/A

PREPARATION INFORMATION: N/A

DISCLAIMER: IN COMPLIANCE WITH THE OSHA HAZARD COMMUNICATION STANDARD, 2.9 C.F.R 1910. 1200, WE ARE PROVIDING YOU WITH A MSDS FOR THE HAZARDOUS MATERIAL YOU ARE PURCHASING.

IT IS YOUR RESPONSIBILITY TO EDUCATE YOUR EMPLOYEES ON THE SAFE USE OF THE HAZARDOUS MATERIAL.

ELECTRON MICROSCOPY SCIENCES MAKES NO PRESENTATION AS TO THE ACCURACY OF THE INFORMATION IN THE MSDS. THE INFORMATION IS BELIEVED TO BE CORRECT; HOWEVER, YOU (THE CUSTOMER), SHOULD PERFORM YOUR OWN INVESTIGATION AND INDEPENDENT VERIFICATION. IF YOU RESELL THE PRODUCT, YOU ARE RESPONSIBLE TO FORWARD THE INFORMATION IN THE MSDS TO YOUR CUSTOMER.