

Material Safety Data Sheet

For Compliance with OSHA 29 CFR 1910.1200 and ANSI Z400.1-2004

1. Product and Company Identification

Product Name SP-20 Water Based Silver Ink	MSDS Code Number N/A
Trade Names & Synonyms	Date of Last Revision 12/31/2010
Chemical Name Water Based Silver Filled Ink	M.E. Taylor Engineering, Inc.
C.A.S. Number N/A	Address 15817 Crabbs Branch Way Rockville, MD 20855
Grades or Minor Variant Identities	Information Telephone Number 301-975-9798
	Emergency Telephone Number 603-595-6275

2. Hazards Identification

Emergency Overview					
Follow procedures for good industrial hygiene.					
Routes of Exposure	Signs and Symptoms	Single, Repeated, or Lifetime Exposure	Severity (Mild, Moderate, Severe)	Acute & Chronic Health Effects	Target Organ(s)
Eye Contact	Mild Irritation	Single	Mild	None	Eyes
Skin Contact	Mild Irritation	Repeated	Mild	Dermatitis	Skin
Inhalation	Mild Irritation, Headache, Nausea, Irritation	Single	Mild	None	Respiratory Tract, Nose, Throat, Lungs
Ingestion	Vomiting, Nausea, Diarrhea	Single	Mild	Unknown	Digestive Tract, Mouth, Chest, Abdomen
Other					
Medical Conditions Aggravated by Exposure None known					
Carcinogenicity (OSHA, IARC, NTP) This material is not known to be carcinogenic.					
Potential Environmental Effects None known					

3. Composition/Information on Ingredients

Hazardous Components	C.A.S. Number	Exposure Limits	% by wt.
Silver	7440-22-4	N/A	20-23%
Proprietary Resins	N/A	None Established	77-80%
*1-Methyl -2-Pyrrolidinone (NMP)	0000872-50-4	None Established	0-10%
N.N-Diethylethanamine	121-44-8	None Established	0-10%
Ethylene Oxide-Propylene Oxide	9003-11-6	None Established	0-10%
OSHA Regulatory Status *Toxic chemical subject to the reporting requirements of sections 313 of Title III and of CFR 372.			

4. First Aid Measures

Routes of Exposure	First Aid Instructions	Immediate Medical Attention	Delayed Effects
Eye X	Flush eyes with plenty of water for at least 15 minutes while holding eyelids open.	Seek medical attention if necessary.	None Established
Skin X	Immediately remove any clothing that came in contact with the chemical. Flush skin with soap and water. Avoid contact with UV- and sunlight.	Seek medical attention if necessary.	None Established
Inhalation X	Move to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be needed.	Seek medical attention if necessary or after significant exposure.	None Established
Ingestion X	Try to prevent vomiting by placing person in recovery position. Do not induce vomiting without medical advice. Wash out mouth with water. Drink several glasses of water if available.	Seek medical attention if necessary.	None Established
Other	Never give anything by mouth to an unconscious person.		
Note to Physician (Treatment, Testing, and Monitoring)			

5. Fire Fighting Measures

Flashpoint & Method 91°C	Flammable (Explosive) Limits in Air (LEL & UEL) N/A	Auto-Ignition Temp. N/A	Other
Flame Propagation or Burning Rate (for solids) Not Tested	Properties Contributing to Fire Intensity None	Flammability Classification 2	
Extinguishing Media Water for Dried Polymer, Water Fog, Alcohol Foam, Dry Powder, Carbon Dioxide, Dry Chem	Extinguishing Media to Avoid None	Reactions to Extinguishing Media None	
Protection and Procedures for Firefighters Do not enter fire area without proper protection. MESA/NIOSH approved self-contained breathing apparatus should be worn when fighting a fire. Fight fire from a safe distance and a protected location. Notify authorities if liquid enters sewer or public waters.			
Unusual Fire and Explosion Hazards May generate carbon monoxide and carbon dioxide when burning. Reacts at extreme temperatures with violent decomposition.			

6. Accidental Release Measures

Personal Precautions See Section 8
Environmental Precautions Prevent contamination of soil or water by using barriers, if necessary. Dispose of in accordance with local, state and federal laws and regulations.
Containment Techniques If material enters drains, it should be pumped out into an open vessel. Emergency services may be required.
Spill/Leak Clean-Up Procedures and Equipment Small spills may be absorbed with an appropriate absorbent (See Section 5) and disposed of properly. Large spills should be removed with vacuum trucks or pumped to storage/salvage vessels. Absorb the remaining residue with an appropriate material (See Section 5). Flush area with water to remove trace residue.
Evacuation Procedures None
Special Instructions The user of this product assumes sole responsibility for any spills or waste generated.
Reporting Requirements Notify authorities if chemical is exposed to public waters or environment.

7. Handling and Storage

Handling Practices and Warnings

Keep away from heat and flame. Avoid contact with skin and eyes. Avoid breathing vapors. Use with adequate ventilation.

Storage Practices and Warnings

Store in cool, dry place, away from excessive heat. Eliminate all possible sources of ignition. Do not allow this material to freeze.

8. Exposure Control/Personal Protection

Ventilation or Local Exhaust	Other Engineering Controls Provide general dilution ventilation or local exhaust as needed to keep vapor concentrations of the ingredients listed in section 2 to below their TLV's. Local exhaust is essential for spraying operations. If effects of overexposure listed in section 5 are evident, ventilation may be inadequate. In restricted ventilation areas, use NIOSH approved chemical cartridge respirators for vapors, or combination chemical cartridge and spray mist filters for mists from spraying. The hazardous ingredients listed in section 3 should be considered in choosing the proper respiratory protection.	
Routes of Entry	Personal Protective Equipment (PPE) for Normal Use	PPE for Emergencies
Eye/Face	Splash proof chemical goggles or equivalent eye protection.	Flush with clean water for at least 15 minutes. Consult a physician.
Skin	Impermeable gloves required. Normal precaution should be taken.	If irritation persists, consult a physician.
Inhalation	In confined areas or in case of very high concentrations, use NIOSH approved air supply or self-contained breathing apparatus.	NIOSH approved air supply or self-contained breathing apparatus.
General Hygiene Consideration and Work Practices Normal good housekeeping, industrial hygiene and personal hygiene practices should be adhered to.		
Protective Measures During Repair and Maintenance of Contaminated Equipment N/A		
Other Protective Measures and Equipment It is recommended that a safety shower and emergency eye wash fountain be available in the immediate vicinity for any potential exposure, wherever this product is handled or used.		

9. Physical and Chemical Properties

Appearance Silver Liquid		Odor Characteristic Odor	
Normal Physical State Liquid	Boiling Point 202°C (Solvent Only)	Melting Point N/A	Freezing Point N/A
Specific Gravity or Density (H₂O = 1) 1.20	Solubility in Water Insoluble	pH N/A	
Vapor Pressure 0.29 mmHg @ 20°C	Vapor Density (AIR = 1) Heavier than Air	Evaporation Rate (Butyl Acetate = 1) Slower than N-Butyl Acetate	
Other			

10. Stability and Reactivity

Incompatibility (Materials to Avoid) Strong acids, strong bases,	
Hazardous Products Produced During Decomposition Carbon Oxides and Nitrous Oxides. Silver is incompatible with acetylene and ethylenimine, which form explosive compounds on contact. If silver is treated with nitric acid in the presence of ethyl alcohol, silver fulminate can be formed, which can be detonated. Fine powder and hydrogen peroxide solutions may explode. Incompatible with oxalic and tartaric acid. Bromoazide explodes on contact with silver.	
Hazardous Polymerization <input type="checkbox"/> May Occur <input checked="" type="checkbox"/> Will Not Occur	Conditions to Avoid Extreme temperatures and excessive aging
Stability <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable	Conditions to Avoid

11. Toxicological Information

Toxicity Data, Epidemiology Studies, Carcinogenicity, Neurological Effects, Genetic Effects, Reproductive Effects, or Structure Activity Data

Acute oral toxicity – LD50 Rat >5,000 mg/kg
Acute dermal toxicity – Mouse LD50 >2,000 mg/kg
Acute Inhalation Toxicity – N/A

Eye irritation/corrosion – Mild eye irritation
Skin irritation/corrosion – Mild skin irritation
Inhalation – Mild irritation

As with all chemical products, skin, eye or respiratory irritation could occur under certain conditions of overexposure. Individuals with pre-existing skin or respiratory disorders may be more susceptible to these effects.

Overexposure to silver may cause argyria, a cosmetic condition characterized by a gray discoloration of skin and eyes.

12. Ecological Information

Toxicity, Environmental Fate, Physical/Chemical Data, or Other Supporting Environmental Hazard Statements

Finished article not tested. Studies indicate the following for silver content only:

Ecotoxicity:

.0053 mg/L LC50 fathead minnow 96 hours
.0076 mg/L LC50 rainbow trout 96 hours
.11 mg/L LC50 fathead minnow 96 hours

13. Disposal Considerations

Regulations

N/A

Properties (Physical/Chemical) Affecting Disposal

Dispose of in accordance with local, state and federal laws and regulations. Incineration or solvent recovery may be considered as possible waste handling methods.

NOTE: State or local requirements may differ from federal regulations. Processing or using this product may make the information here inappropriate. Waste generators are responsible for waste classification, transport, and disposal.

14. Transport Information

Regulated for Shipping?

Yes No

Proper Shipping Name

SP-20 Water Based Silver Ink

Do changes in quantity, packaging, or shipment method change product classification?

Yes No

Hazard Class

Class 3 Flammable Liquid

15. Regulatory Information

Federal Regulations (OSHA, TSCA, CERCLA, FIFRA, EPCRA, CAA, SWA, SDWA, CPSA, DEA, FDA/USDA, etc.)

Toxic chemical subject to the reporting requirements of sections 313 of Title III and of CFR 372.

Consumer Product Safety Act (CPSIA)

M.E. Taylor Engineering, Inc. products do not contain Lead.

M.E. Taylor Engineering, Inc. products do not contain Phthalates.

State Regulations

N/A

International Regulations

EU Directive 2002/95/EC – Restriction of Hazardous Substances (**RoHS**) “banned substances” along with EU Directive 2002/96/EC – Waste from Electrical and Electronic Equipment (**WEEE**)

M.E. Taylor Engineering, Inc. products do not exceed the amount of allowable levels concerning: Cadmium (Cd); Hexavalent Chromium (CrVI); Mercury (Hg); Lead (Pb); Polybrominated Biphenyls (PBB's) as bromide; Polybrominated Diphenyl Ethers (PBDEs) as bromide, decaBDE

Registration, Evaluation and Authorization of Chemicals (EU - **REACH**) & Substances of Very High Concern (**SVHC**)

M.E. Taylor Engineering, Inc. products shipped into the EU are considered “Articles”. REACH Article 3(3) defines Article as: “an object which during production is given a special shape, surface or design which determines its function to a

greater degree than its chemical composition".

M.E. Taylor Engineering, Inc. products do not contain substances on the SVHC list as of December 31, 2010.

Other

Ozone-Depleting Substances (ODS)

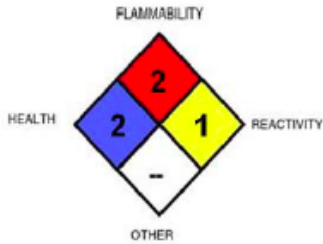
M.E. Taylor Engineering, Inc. products do not contain Ozone-Depleting substances nor are Ozone-Depleting Substances used in our manufacturing process. e.g. Chlorofluorocarbons (CFCs); Halons; Carbon Tetrachloride; Methyl Chloroform; Methyl Bromide; Hydro Bromofluorcarbon (HFBCs); and Hydro Chlorofluorcarbon (HCFCs)

Natural Latex

M.E. Taylor Engineering, Inc. products do not contain natural rubber latex.

16. Other Information

Label Text, Hazard Rating Systems, Key Legend, or Other



The information supplied herein is presented in good faith and believed to be accurate to the best knowledge of M.E. Taylor Engineering, Inc. However, since conditions of use are beyond our control, we make no expressed or implied warranties as to the use of this information, the fitness of this product for a particular purpose, or the merchantability of this product. This information is offered solely for your consideration and interpretation.