



MATERIAL SAFETY DATA SHEET

Prepared in accordance with ISO 11014-1/ ANSI standard
Z400.1-2004

Revision Date: 13/June/2011
Product Code: CCI-300

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Cabot Conductive Ink 300

Synonyms: CCI-300

Use of the Substance/Preparation: Printing Inks

Supplier: Cabot Superior Micropowders
5401 Venice Ave. NE
Albuquerque, NM 87113
UNITED STATES
Tel: 1-505-342-1492
Fax: 1-505-342-2168

Emergency Telephone Number: US: CHEMTREC 1-800-424-9300 or 1-703-527-3887

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW - CAUTION:

Danger: Highly Flammable. A grey-green liquid. Harmful if swallowed, inhaled or absorbed through skin. Irritating to eyes, respiratory system and skin. May cause sensitization by skin contact. Affects central nervous system. Avoid contact with skin and eyes. Do not breathe vapors/spray. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Principle Routes of Exposure: Inhalation, Eye contact, Skin contact

POTENTIAL HEALTH EFFECTS

Eye Contact: Irritating to eyes. Avoid contact with eyes.

Skin Contact: Harmful if absorbed through the skin. Irritating to skin. May cause sensitization. Exposure to silver compounds may cause argyria, a permanent bluish-grey discoloration of the skin, eyes and mucous membranes. Avoid contact with skin.

Inhalation: Harmful by inhalation. Irritating to respiratory system. Vapor may cause drowsiness and dizziness. Prolonged exposure can cause nausea, headache and vomiting. Affects the central nervous system. Silver particles can easily abrade off the printed substrate. Repeated exposure to silver compounds above the recommended occupational exposure limit may cause argyria, a permanent bluish-grey discoloration of the skin, eyes and mucous membranes. Do not breathe dust, vapors or mist.

Ingestion: Harmful if swallowed. Ethylene glycol is rapidly absorbed by ingestion and may cause neurological, cardiopulmonary and renal effects and acidosis. Exposure to silver compounds may cause argyria, a permanent bluish-grey discoloration of the skin, eyes and mucous membranes.

Carcinogenic Effects: Component(s) listed by IARC (International Agency for Research on Cancer). See also Section 11.

Target Organ Effects: Lungs, Eyes, Skin, Liver, Kidney, Central Nervous System

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorder, Skin disorders

Potential Environmental Effects: Unknown. Contains a component that is toxic to aquatic life and may cause long lasting effects in the environment. Avoid release into the environment. Contain and collect any spilled material. See also Section 12.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS Number	EINECS/ELINCS Number	Weight %	EU Classification
Ethanol	64-17-5	200-578-6	10-70	F; R11
Silver	7440-22-4	231-131-3	2-55	N;R50/53
Ethylene Glycol	107-21-1	203-473-3	10-40	Xn; R22
Proprietary component		Listed	5-40	None

4. FIRST AID MEASURES

Skin Contact: Wash thoroughly with soap and water. Seek medical attention if redness, swelling, itching, or burning occurs.

Eye Contact: Flush eyes immediately with large amounts of water for 15 minutes. Seek medical attention if redness, swelling, itching, burning or visual disturbances occur.

Inhalation: If cough, shortness of breath or other breathing problems occur, move to fresh air. Seek medical attention if symptoms persist. If necessary, restore normal breathing through standard first aid measures.

Ingestion: Do not induce vomiting. If conscious, give several glasses of water. Never give anything by mouth to an unconscious person.

Notes to Physician: Treat symptomatically. When ingested, early symptoms mimic alcohol inebriation and are followed by nausea, vomiting, abdominal pain, weakness, muscle tenderness, respiratory failure, convulsions, cardiovascular collapse, pulmonary edema, hypocalcemic tetany and severe metabolic acidosis. Without treatment death may occur in eight to 24 hours. Victims who survive the initial toxicity period usually develop renal failure along with brain and liver damage. Early administration of ethanol may counter the toxic effects - metabolic acidosis and renal damage. Hemodialysis or peritoneal dialysis have been of benefit. New Eng. J. Med. 304:21 1982. 4-Methyl pyrazole is an effective blocker of alcohol dehydrogenase and is available now as fomepizole (Antizol ®) and should be used in the treatment of ethylene glycol intoxication. *Antizol is a registered trademark of Orphan Medical, Inc.

5. FIRE AND IGNITION INFORMATION

Flash Point: Not determined

Explosion Limits in Air - Upper (g/m³): Not determined

Explosion Limits in Air - Lower (g/m³): Not determined

OSHA Flammability Classification: Flammable

Autoignition Temperature: Not determined

Extinguishing Media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special Protective Equipment for Firefighters: Wear suitable protective equipment. In the event of fire, wear self-contained breathing apparatus.

Specific Hazards:	Ethylene glycol vapors are heavier than air and may collect in low areas. Vapor may travel back considerable distances to source of ignition and flash back. May emit toxic fumes during fire conditions. Container explosion can occur under fire conditions.
Hazardous Decomposition and/or Combustion Products:	Carbon monoxide, Carbon dioxide, Oxides of silver.
Risk of Dust Explosion:	Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:	Avoid formation of dust and aerosols. Avoid contact with skin, eyes and clothing. Do not breathe gas/fumes/vapor/spray. Ensure adequate ventilation. Remove all sources of ignition. Use personal protective equipment. See also Section 8.
Methods for Cleaning Up:	Soak up with inert absorbent material. Pick up and transfer to properly labelled containers. See Section 13.
Environmental Precautions:	Do not allow material to contaminate ground water system. Local authorities should be advised if significant spillages cannot be contained. See also Section 13.

7. HANDLING AND STORAGE

Handling:	Avoid formation of dust, aerosol, or mist. Avoid inhalation of silver ink aerosol. Avoid handling dried, uncured ink. Silver particles can easily abraid off the printed substrate. Do not breathe dust. Avoid contact with skin and eyes. Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. Avoid prolonged or repeated exposure.
Storage:	Keep in properly labeled containers. Keep away from heat and sources of ignition. Do not store together with strong oxidizing agents. Keep at ambient temperatures.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

There are no exposure limits identified for this specific product. Exposure limits for components are stated below.

Ethanol (CAS RN 64-17-5):	Belgium:	1000 ppm, 1907 mg/m ³ , TWA
	Denmark:	1000 ppm, 1900 mg/m ³ , TWA
	Finland:	1000 ppm, 1900 mg/m ³ , TWA
		1300 ppm, 2500 mg/m ³ , 15-min STEL
	France:	1000 ppm, 1900 mg/m ³ , VME,
		5000 ppm, 9500 mg/m ³ , VLCT
	Germany - TRGS 900:	500 ppm, 960 mg/m ³ , TWA
		1000 ppm, 1920 mg/m ³ , PEAK
	Ireland:	1000 ppm, 1900 mg/m ³ , TWA
	Switzerland:	500 ppm, 960 mg/m ³ , MAK
		1000 ppm, 1920 mg/m ³ , STEL
	United Kingdom:	1000 ppm, 1920 mg/m ³ , TWA
		3000 ppm, 5760 mg/m ³ , STEL
	US ACGIH TLV:	1000 ppm STEL
	US OSHA PEL:	1000 ppm, 1900 mg/m ³ , TWA

Ethylene Glycol, CAS RN 107-21-1:	Austria MAK:	26 mg/m ³ , TWA 52 mg/m ³ , Ceiling	
	Belgium OEL:	52 mg/m ³ , 8-hour TWA 104 mg/m ³ , 15-minute STEL	
	Denmark:	26 mg/m ³ , TWA	
	Finland:	50 mg/m ³ , 8-Hour limit 100 mg/m ³ , 15-Minute limit	
	France:	125 mg/m ³ , VLE	
	Germany TRGS 900:	26 mg/m ³ , (10 ppm), TWA	
	Ireland OEL:	52 mg/m ³ , 8-hour TWA - Vapor 104 mg/m ³ , 15-minute STEL - Vapor 10 mg/m ³ , 8-hour TWA - Particulate	
	Italy OEL:	52 mg/m ³ , 8-hour TWA 104 mg/m ³ , 15-minute STEL	
	Netherlands MAC:	52 mg/m ³ , TWA (TGG) 104 mg/m ³ , STEL	
	Norway:	10 mg/m ³ , TLV; 25 ppm, Ceiling	
	Portugal:	52 mg/m ³ , 8-hour TWA 104 mg/m ³ , 15-minute STEL	
	Spain:	52 mg/m ³ , VLA-ED 104 mg/m ³ , 15-minute STEL (VLA-EC)	
	Sweden:	25 mg/m ³ , NGV 50 mg/m ³ , KTV	
	Switzerland	26 mg/m ³ , TWA 52 mg/m ³ , STEL	
	UK EH40 OES (Table 2):	52 mg/m ³ , TWA - Vapor 104 mg/m ³ , STEL - Vapor 10 mg/m ³ , TWA - Particulate	
	US ACGIH TLV:	100 mg/m ³ , Ceiling	
	Silver metal, CAS RN 7440-22-4:	Austria MAK:	0.01 mg/m ³ , TWA
		Belgium:	0.1 mg/m ³ , TWA
		Denmark:	0.01 mg/m ³ , TWA
Finland:		0.1 mg/m ³ , TWA	
France:		0.1 mg/m ³ , VME	
Germany TRGS 900 MAK:		0.1 mg/m ³ , TWA	
Ireland:		0.1 mg/m ³ , TWA	
Italy:		0.1 mg/m ³ , TWA	
Norway:		0.1 mg/m ³ , TWA	
Switzerland:		0.1 mg/m ³ , TWA	
UK EH40 OES (Table 2):		0.1 mg/m ³ , TWA	
US ACGIH TLV:		0.1 mg/m ³ , TWA	
US OSHA PEL:		0.01 mg/m ³ , TWA	

INRS: Institut National de Recherche et de Securite (National Institute of Research and Security)

MAC: Maximaal Aanvaarde Concentraties (Maximum allowed concentration)

MAK: Maximale Arbeitsplatzkonzentration (Maximum Workplace Concentration)

OEL: Occupational Exposure Limit

PEL: Permissible Exposure Limit

STEL: Short Term Exposure Limit

TLV: Threshold Limit Value

TRGS: Technische Regeln für Gefahrstoffe (Technical Rule for Hazardous Materials)

TWA: Time Weighted Average

US ACGIH: United States American Conference of Governmental Industrial Hygienists

US OSHA: United States Occupational Safety and Health Administration

VME: Valeur Moyenne d'Exposition (Average Level of Exposure)

VLA: Valore Limite Ambientales (Environmental Limit Value)

ENGINEERING CONTROLS

Prevent the creation of flammable or explosive concentrations of vapor in air and avoid vapor concentration higher than the occupational exposure limits. Provide appropriate exhaust ventilation at machinery and at places where vapors can be generated.

PERSONAL PROTECTIVE EQUIPMENT**Respiratory Protection:**

NIOSH-approved respirator may be necessary if local exhaust ventilation is not adequate.

Hand Protection:

Wear suitable gloves.

Eye Protection:

Wear eye/face protection. Safety glasses with side-shields. Goggles.

Skin and Body Protection:

Wear suitable protective clothing. No special protective equipment required.

Other:

Handle in accordance with good industrial hygiene and safety practice. Emergency eyewash and safety shower should be located nearby.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Grey-Green Liquid
Odor:	Alcohol
Odor Threshold:	Not determined
pH:	Not determined
Vapor Pressure:	Not determined
Vapor Density:	Not determined
Boiling Point/Range:	Not determined
Melting Point/Range:	Not applicable
Water Solubility:	Soluble
Relative Density:	1.1-1.9 g/mL @ 22°C
VOC Content(%):	> 50%
Evaporation Rate:	Not determined
Viscosity:	4-18 cps
Partition Coefficient (n-octanol/water):	Not determined
Surface Tension:	28-36 mN/m

10. STABILITY AND REACTIVITY

Stability:	Stable
Reactivity:	May react exothermically upon contact with strong oxidizers.
Incompatible Materials:	Strong oxidizers such as chlorates, bromates, and nitrates.
Hazardous Polymerization:	Hazardous polymerization does not occur.

Mechanical Sensitivity (shock): Not sensitive to mechanical impact.

Conditions to Avoid: Avoid contact with strong acids, strong alkalis and oxidizing agents. Remove all sources of ignition.

Hazardous Decomposition and/or Combustion Products: Carbon monoxide, Carbon dioxide, Oxides of silver.

Static Discharge Effects: Not applicable.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Oral LD50: Not determined.

Inhalation LC50:
Not determined.

Dermal LD50: Not determined.

STOT - Single Exposure: No data are available on the product itself.

Eye Irritation: Irritating to eyes.

Skin Irritation: Irritating to skin

SUBCHRONIC TOXICITY

No data are available on the product itself.

STOT - Repeated Exposure: No data are available on the product itself

CHRONIC TOXICITY

Mutagenic Effects:

Ethylene glycol has been tested and found not to be mutagenic in F344 rats, Human embryonic fibroblasts, Syrian hamster embryo (SA7/SHE) cells, Chinese hamster ovary cells, mouse lymphoma L5178Y cells, Neurospora crassa, Drosophila melanogaster, and Salmonella typhimurium. Chromosomal aberrations occurred in bone marrow cells of male rats 50 hours after a single oral dose of 1,200 mg/kg and dominant lethal mutations occurred in rats treated with 120 and 1,200 mg/kg, No data are available on the product itself.

Reproductive Toxicity: Component(s) has shown teratogenic effects in laboratory animals. No data are available on the product itself.

Sensitization: Contains a skin sensitizer.

Synergistic Materials: None reasonably foreseeable.

Carcinogenic Effects: Substance listed by IARC (International Agency for Research on Cancer). Ethanol (CAS RN 64-17-5) (in alcoholic beverages) is classified as an IARC 1 substance.

Aspiration Hazard: Not determined

12. ECOLOGICAL INFORMATION

Aquatic Toxicity: Ionic silver is highly toxic to aquatic organisms.
No data are available on the product itself.

ENVIRONMENTAL FATE

Mobility: Ethylene glycol has high mobility in soil and water. The mobility of silver depends on its form, with sorption often controlling its movement in water, sediment and soils. No data are available on the product itself.

Bioaccumulation: Dissolved silver has been demonstrated to bioaccumulate in aquatic organisms. No data are available on the product itself.

Persistence / Degradability: Ethylene glycol is expected to readily biodegrade in soil and water. No data are available on the product itself.

Distribution to Environmental Compartments: Not determined.

13. DISPOSAL CONSIDERATIONS

Disclaimer: Information in this section pertains to the product as shipped in its intended composition as described in Section 3 of this MSDS. Contamination or processing may change waste characteristics and requirements. Regulations may also apply to empty containers, liners or rinsate. State/provincial and local regulations may be different from federal regulations.

RCRA Classification (40 CFR 261): A hazardous waste. RCRA Class D011 .

Unused and Uncontaminated Product: Product, as supplied, should be disposed of in accordance with the regulations issued by the appropriate federal, state and local authorities. Same consideration should be given to containers and packaging.

14. TRANSPORT INFORMATION

US Department of Transportation (US DOT) Hazardous Materials Regulations Status: Use UN Classification listed.

UN Number: 1170

UN Proper Shipping Name: Ethanol Solution

UN Shipping Class: 3

UN Packing Group: II

IMDG (International Maritime Organization's Dangerous Goods Code): Use UN classification listed above.

IATA: Use UN classification listed above.

15. REGULATORY INFORMATION

Hazard Classification

United States - OSHA (29 CFR 1910.1200): Hazardous.

Mexico - NOM-018-STPS-2000: Refer to HMIS Rating in Section 16.

Canada - WHMIS Classification (CPR, SOR/88-66): The classification for this product has not been determined, Ethylene glycol is classified as D2A, Ethanol is classified as D2B and B2.

Chemical Name	WHMIS Ingredient Disclosure List:
Ethanol	0.1 %
Silver	1 %
Ethylene Glycol	1 %

International Inventories

All components of this product are listed on or exempt from the following inventories:

- YES - Australian Inventory of Chemical Substances (AICS)
- YES - Canadian Domestic Substances List (DSL)
- YES - Chinese Inventory
- YES - European Inventory of Existing Commercial Chemical Substances (EINECS)
- YES - Japanese Existing and New Chemical Substances (ENCS)
- YES - Korean Existing Chemicals List (KECL)
- NO - New Zealand Hazardous Substances and New Organisms Act (HSNO)
- YES - Philippine Inventory of Chemicals and Chemical Substances (PICCS)
- YES - United States Toxic Substances Control Act (TSCA) Inventory

U.S. Federal Regulations

TSCA 12(b) Export Notification: This product does not contain any components that are subject to TSCA 12(b) Export Notification.

Clean Air Act Amendments of 1990 (CAA, Section 112, 40 CFR 82): This product contains a component(s) listed as a Hazardous Air Pollutant, Flammable Substance, Toxic Substance, or Class 1 or 2 Ozone Depletor.

- Ethylene glycol

Clean Water Act (CWA, 40 CFR 116) Priority Pollutants: This product contains a listed Priority Pollutant(s).

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, 40 CFR 302): This product contains a listed Hazardous Substance(s).

- Ethylene glycol (CAS RN 107-21-1)
- Silver metal (CAS RN 7440-22-4)

Superfund Amendments and Reauthorization Act, Title III (SARA):

SARA Section 302 (40 CFR 355) Extremely Hazardous Substances: No components are listed as extremely hazardous substances under SARA Section 302.

SARA Sections 311/312 (40 CFR 370) Hazard Category: ACUTE/IMMEDIATE HEALTH HAZARD. CHRONIC/DELAYED HEALTH HAZARD. FIRE HAZARD. Reporting may be required if the material is present at any one time in amounts equal to or greater than 10,000 pounds.

SARA Section 313 (40 CFR 372) Toxics Release Inventory: This material contains the following chemicals on the List of Toxic Chemicals:

Chemical Name	SARA Section 313 Emission Reporting
Silver	1.0
Ethylene Glycol	1.0

Pharmaceutical Information: Not permitted

U.S. State Regulations

California Proposition 65: This product contains a component(s) that is listed on California Proposition 65.

Ethanol (CAS RN 64-17-5) is a California Proposition 65 listed substance due to its developmental toxicity when in alcoholic beverages.

US Coalition of NorthEastern Governors (CONEG) Metals List: Not determined.

16. OTHER INFORMATION

16. OTHER INFORMATION**HMIS Rating****HMIS Index:** * - chronic, 0 - minimal, 1 - slight, 2 - moderate, 3 - serious, 4 - severe**Health:** 2***Flammability:** 4**Physical Hazard:** 1**NFPA Rating****NFPA Index:** 0- minimal, 1-slight, 2-moderate, 3-serious, 4-severe

Health: 2

Flammability: 4

Reactivity: 1

Prepared by: Cabot Corporation - Safety, Health and Environmental Affairs
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Disclaimer:

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