



MATERIAL SAFETY DATA SHEET

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MSDS-E-CW100L






Prepared to OSHA, ACC, ANSI, WHMIS & 2001/58 EC Standards

MSDS Revision: 3.0

MSDS Revision Date: 02/15/2008

1. PRODUCT IDENTIFICATION

CHEMICAL RESPONSE CARD: 04

1.1	Product Name:	CircuitWriter™ CW100L	RESPONSE TEAM PPE:   	
1.2	Chemical Name:	See ingredients listed in section 2		
1.3	Synonyms:	CircuitWriter CW100L	WHMIS:  	
1.4	Trade Names:	CircuitWriter CW100L		
1.5	Product Use:	Precision Conductive Ink	HEALTH:	2
1.6	Manufacturer's Name:	CAIG Laboratories, Inc.	FLAMMABILITY:	3
1.7	Manufacturer's Address:	12200 Thatcher Court, Poway, CA 92064-6876	REACTIVITY:	1
1.8	Business Phone:	+1 (800)-224-4123	PERSONAL PROTECTION:	B
1.9	Emergency Phone:	CHEMTREC 1-800-424-9300/1-703-527-3887		
1.10	Other Product Names:	Part No. CW100P, PEN Applicator, 5 grams Part No. CW100L-4, Bottle, 125 grams Part No. CW100L-12, Can, 375 grams Part No. CW100L-32, Can, 1000 grams		

2. COMPOSITION & INGREDIENT INFORMATION

CHEMICAL NAME(S)	CAS No.	RTECS No.	EINECS No.	%	EXPOSURE LIMITS IN AIR (mg/m ³)					
					ACGIH		OSHA		OTHER	
					TLV ppm	STEL ppm	PEL ppm	STEL ppm		IDLH ppm
SILVER	7440-22-4	VW3500000	2311313	30-60	(0.01)	NE	NE	NE	NE	
4-CHLOROBENZOTRIFLUORIDE	98-56-6	XS9145000	202-681-1	20-30	NE	NE	NE	NE	NE	
ACETONE	67-64-1	AL3150000	200-662-2	10-20	1000	NE	750	NE	NE	
ACRYLIC RESIN	UNK	UNK	UNK	3-5	NA	NA	NA	NA	NA	
ORGANOPHILIC CLAY	71011-27-3	NA	275-128-5	1-2	(1.0)	NE	NE	NE	NE	

NA = Not Available; ND = Not Determined; NE = Not Established; C = Ceiling Limit; See Section 16 for Additional Definitions of Terms Used
NOTE: all WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-2003 format.



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3. HAZARD IDENTIFICATION

3.1 Hazard Identification:
Thin silver fluid with a mild odor. Flammable liquid. Breathing high concentrations of product above permissible exposure limits may result in severe or permanent toxic effects.

3.2 Routes of Entry: Inhalation: **YES** Absorption: **YES** Ingestion: **YES**

3.3 Effects of Exposure:
EYES: May cause severe eye irritation, burning, blurred vision.
SKIN: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.
INGESTION: May result in severe or permanent toxic effects.
INHALATION: Not harmful in low quantities.

3.4 Symptoms of Overexposure:
EYES: May cause severe eye irritation, burning, blurred vision.
SKIN: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.
INGESTION: May result in severe or permanent toxic effects.
INHALATION: Repeated inhalation of concentration above permissible exposure limits may result in severe or permanent toxic effects.

3.5 Acute Health Effects:
EYES: May cause severe eye irritation, burning, blurred vision.
SKIN: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.
INGESTION: May result in severe or permanent toxic effects.
INHALATION: Repeated inhalation of concentration above permissible exposure limits may result in severe or permanent toxic effects.

3.6 Chronic Health Effects:
EYES: May cause severe eye irritation, burning, blurred vision.
SKIN: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.
INGESTION: May result in severe or permanent toxic effects.
INHALATION: Repeated inhalation of concentration above permissible exposure limits may result in severe or permanent toxic effects.

3.7 Target Organs:
Eyes, skin and respiratory system.

4. FIRST AID MEASURES

4.1 First Aid:
EYES: Flush eyes thoroughly with copious amounts of water for at least 15 minutes, holding eyelid(s) open to ensure complete flushing. If irritation persists, seek immediate medical attention.
SKIN: Remove contaminated clothing and wash affected areas with soap and water. If irritation persists, seek prompt medical attention. Do not wear contaminated clothing until after it has been properly cleaned.
INGESTION: keep person warm, quiet, and get medical attention immediately.
INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical attention.

4.2 Medical Conditions Aggravated by Exposure:
None reported by the manufacturer.

HEALTH	2
FLAMMABILITY	3
REACTIVITY	1
PROTECTIVE EQUIPMENT	B
EYES	SKIN



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5. FIREFIGHTING MEASURES

5.1	Flashpoint & Method: -15°C 5°F
5.2	Autoignition Temperature: NA
5.3	Flammability Limits: Lower Explosive Limit (LEL): 1.2 Upper Explosive Limit (UEL): 10.7
5.4	Fire & Explosion Hazards: CO and CO2
5.5	Extinguishing Methods: CO₂, Alcohol foam, Dry Chemical
5.6	Firefighting Procedures: Wear NIOSH/MSHA approved self-contained breathing apparatus and protective clothing. Do not use water. Prevent runoff from fire control or dilution from entering sewers, drains, drinking water supply, or any natural waterway.



6. ACCIDENTAL RELEASE MEASURES

6.1	Spills: Secure spill area and deny entry to all unprotected individuals. Individuals involved in the cleanup should wear appropriate personal protective equipment. Area may become slippery. Absorb product onto porous material, such as sand, clay, diatomaceous earth or commercial absorbent material. Place into leak-proof, U.S. DOT-approved containers. If necessary, cover all drains and dike well ahead of the spill to prevent runoff into sewers, drains, and all waterways. Contact appropriate local or provincial authorities for assistance and/or reporting requirements.
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7. HANDLING & STORAGE INFORMATION

7.1	Work & Hygiene Practices: Wash hands thoroughly after using this product and before eating, drinking, or smoking. Remove soiled clothing to prevent prolonged skin contact.
7.2	Storage & Handling: Keep away from all sources of ignition and hot surfaces. Do not expose to sunlight or elevated temperatures to prevent possible bursting. Use and store in cool, dry, well ventilated areas away from heat, hot surfaces and all sources of ignition. Protect containers from physical damage. Indoor storage should meet OSHA standards and appropriate codes. Keep container tightly closed when not in use. Keep out of reach of children. Avoid prolonged or repeated contact with skin; eyes or clothing. Avoid breathing product vapor for extended periods of time. Avoid activities that could cause splashing of the spilled material or create mists.
7.3	Special Precautions:

8. EXPOSURE CONTROLS & PERSONAL PROTECTION

8.1	Ventilation & Engineering Controls: Use with adequate ventilation (e.g., open doors and windows, local exhaust ventilation). Ensure appropriate decontamination equipment is available (e.g., sink, safety shower, eye-wash station).
8.2	Respiratory Protection: Not necessary unless used in an unventilated area or in high concentrations. If exceeded, a mechanical or self contained breathing apparatus is advised.
8.3	Eye Protection: Wear splash goggles or other appropriate eye protection.
8.4	Hand Protection: Wear chemically resistant rubber gloves with repeated exposure.
8.5	Body Protection: None required for normal conditions of use.



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9. PHYSICAL & CHEMICAL PROPERTIES

9.1	Density:	1.1
9.2	Boiling Point:	56.2°C – 133°F
9.3	Melting Point:	NA
9.4	Evaporation Rate:	> 1
9.5	Vapor Pressure:	184 mm Hg
9.6	Specific Gravity (Water=1):	1.62
9.7	Appearance & Color:	Thin silver fluid
9.8	Odor Threshold:	Mild odor
9.9	Solubility:	Does not dissolve in water
9.10	pH	ND
9.11	VOC (grams/liter):	60
9.12	Other Information:	NA

10. STABILITY & REACTIVITY

10.1	Stability:	Stable under normal conditions of use (see section 7)
10.2	Hazardous Decomposition Products:	CO, CO2
10.3	Hazardous Polymerization:	Will not occur
10.4	Conditions to Avoid:	Avoid all possible sources of ignition
10.5	Incompatible Substances:	Strong oxidizing agents

11. TOXICOLOGICAL INFORMATION

11.1	Toxicity Data:	This product has not been tested on animals to obtain toxicological data. There are toxicology data for the components of this product, which are found in the scientific literature. These data have not been presented in this document.
11.2	Acute Toxicity:	See section 3.5
11.3	Chronic Toxicity:	See section 3.6
11.4	Suspected Carcinogen:	NE
11.5	Reproductive Toxicity:	This product is not reported to produce reproductive toxicity in humans.
	Mutagenicity:	This product is not reported to produce mutagenic effects in humans.
	Embryotoxicity:	This product is not reported to produce embryotoxic effects in humans.
	Teratogenicity:	This product is not reported to produce teratogenic effects in humans.
	Reproductive Toxicity:	This product is not reported to produce reproductive effects in humans.
11.6	Irritancy of Product:	See Section 3.3
11.7	Biological Exposure Indices:	NE
11.8	Physician Recommendations:	Treat symptomatically.

12. ECOLOGICAL INFORMATION

12.1	Environmental Stability:	This product will slowly volatile from soil. Components of this product will slowly decompose into organic compounds.
12.2	Effects on Plants & Animals:	There is no specific data available for this product.
12.3	Effects on Aquatic Life:	Releases of large volumes of this product are expected to be harmful or fatal to overexposed aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1	Waste Disposal:	Dispose of in accordance with federal, state or local regulations.
13.2	Special Considerations:	EPA Waste Code: D001 (characteristic – ignitability)



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14. TRANSPORTATION INFORMATION

The basic description (proper shipping name, hazard class & division, ID Number, packing group) is shown for each mode of transportation. Additional descriptive information may be required by 49 CFR, IATA/ICAO, IMDG and the CTDGR.

14.1	49 CFR (GND): SMALL QUANTITY - PACKAGE MARKED "THIS PACKAGE CONFORMS TO 49 CFR §173.4" (≤ 30 ml) CONSUMER COMMODITY, ORM-D (> 30 ml, <1.0L)	 
14.2	IATA (AIR): EXCEPTED QUANTITY - PACKAGE LABELED WITH EXCEPTED QUANTITIES LABEL PER IATA §2.7 (≤ 30 ml) CONSUMER COMMODITY, 9, ID8000 (≤ 500 ml) ACETONE SOLUTION, 3, UN1090, II (>500 ml)	
14.3	IMDG (OCN): ACETONE SOLUTION, 3, UN1090, II, LTD QTY	
14.4	TDGR (Canadian GND): MARK PACKAGE "LIMITED QUANTITY" or "QUANTITÉ LIMITÉE" or "LTD QTY" or "QUANT LTÉE" (≤ 1.0 L) ACETONE SOLUTION, 3, UN1090, II (> 1.0 L)	
14.5	ADR/RID (EU): 1090 ACETONE SOLUTION, 3, II ADR, LTD QTY (≤ 1.0 L) 1090 ACETONE SOLUTION, 3, II, ADR (> 1.0 L)	

15. REGULATORY INFORMATION

15.1	SARA Reporting Requirements: NA	
15.2	SARA Threshold Planning Quantity: NA	
15.3	TSCA Inventory Status: All chemical substances of this product are listed on the TSCA inventory or are otherwise exempt from inventory status.	
15.4	CERCLA Reportable Quantity (RQ): Acetone: 5000 lbs	
15.5	Other Federal Requirements: NA	
15.6	Other Canadian Regulations This product has been classified according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR. The components of this product are listed on the DSL/NDSL. None of the components of this product are listed on the Priorities Substances List.	 
15.7	State Regulatory Information: The primary components of this product is listed on the following state lists: California OSHA; Massachusetts Right to Know List of Chemicals; New Jersey Right to Know List 8:59 Appendix A; Pennsylvania Hazardous Substances List 34 323 Appendix A	
15.8	67/548/EEC (European Union) Requirements: The primary component of this product is listed in Annex I of EU Directive 67/548/EEC: Acetone: Highly Flammable (F+, Xn). R: 11-36/37/38-66-67- Flammable. Irritating to eyes, respiratory system and skin. Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness. S: 9-16-23-26-33 - Keep container in a well-ventilated place. Keep away from sources of ignition. Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Take precautionary measures against static discharges.	 



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16. OTHER INFORMATION

16.1 Other Information:

NA

16.2 Terms & Definitions:

See page 7 of this MSDS.

16.3 Disclaimer:

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR §1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of ShipMate's & CAIG Laboratories, Inc.'s knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either expressed or implied, are provided. The information contained herein relates only to the specific product(s). If this product(s) is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

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DEFINITION OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these that are commonly used include the following:

GENERAL INFORMATION:

CAS No.	Chemical Abstract Service Number
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EXPOSURE LIMITS IN AIR:

ACGIH	American Conference on Governmental Industrial Hygienists
TLV	Threshold Limit Value
OSHA	U.S. Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
IDLH	Immediately Dangerous to Life and Health

FIRST AID MEASURES:

CPR	Cardiopulmonary resuscitation - method in which a person whose heart has stopped receives manual chest compressions and breathing to circulate blood and provide oxygen to the body.
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HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: HMIS

HEALTH, FLAMMABILITY & REACTIVITY RATINGS:

0	Minimal Hazard
1	Slight Hazard
2	Moderate Hazard
3	Severe Hazard
4	Extreme Hazard



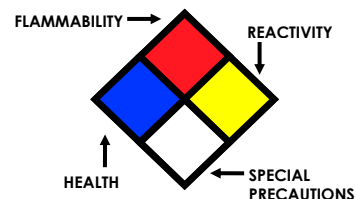
NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

FLAMMABILITY LIMITS IN AIR:

Autoignition Temperature	Minimum temperature required to initiate combustion in air with no other source of ignition
LEL	Lower Explosive Limit - lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source
UEL	Upper Explosive Limit - highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source

HAZARD RATINGS:

0	Minimal Hazard
1	Slight Hazard
2	Moderate Hazard
3	Severe Hazard
4	Extreme Hazard
ACD	Acidic
ALK	Alkaline
COR	Corrosive
-W	Use No Water
OX	Oxidizer



TOXICOLOGICAL INFORMATION:

LD₅₀	Lethal Dose (solids & liquids) which kills 50% of the exposed animals
LC₅₀	Lethal concentration (gases) which kills 50% of the exposed animal
ppm	Concentration expressed in parts of material per million parts
TD₁₀	Lowest dose to cause a symptom
TCLo	Lowest concentration to cause a symptom
TD₁₀, LD₁₀, & LD₀ or TC, TC₀, LC₁₀, & LC₀	Lowest dose (or concentration) to cause lethal or toxic effects
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
RTECS	Registry of Toxic Effects of Chemical Substances
BCF	Bioconcentration Factor
TL_m	Median threshold limit
log K_{ow} or log K_{oc}	Coefficient of Oil/Water Distribution

REGULATORY INFORMATION:

WHMIS	Canadian Workplace Hazardous Material Information System
DOT	U.S. Department of Transportation
TC	Transport Canada
EPA	U.S. Environmental Protection Agency
DSL	Canadian Domestic Substance List
NDSL	Canadian Non-Domestic Substance List
PSL	Canadian Priority Substances List
TSCA	U.S. Toxic Substance Control Act
EU	European Union (European Union Directive 67/548/EEC)

EC INFORMATION:

C	E	F	N	O	T+	Xi	Xn
Corrosive	Explosive	Flammable	Harmful	Oxidizing	Toxic	Irritant	Harmful

PERSONAL PROTECTION RATINGS:

A		G	
B		H	
C		I	
D		J	
E		K	
F		X	Consult your supervisor or S.O.P. for special handling directions.

Safety Glasses	Splash Goggles	Face Shield & Eye Protection	Gloves
Boots	Synthetic Apron	Full Suit	Dust Respirator
Vapor Respirator	Dust & Vapor Respirator	Full Face Respirator	Airline Hood/Mask or SCBA

Note: the dotted circle indicates that this respiratory protective equipment is required for high concentrations or for large volume spills or releases of product.

OTHER STANDARD ABBREVIATIONS:

NA	Not Available
NR	No Results
NE	Not Established
ND	Not Determined
ML	Maximum Limit
SCBA	Self-Contained Breathing Apparatus