



MATERIAL SAFETY DATA SHEET

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MSDS-E-CK44-A

Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS & 2001/58 EC Standards | MSDS Revision: 1.0 | MSDS Revision Date: 03/23/2011

1. PRODUCT IDENTIFICATION			CHEMICAL RESPONSE CARD: 02			
1.1	Product Name:	CaiKote™ 44	RESPONSE TEAM PPE:			
1.2	Chemical Name:	See ingredients listed in section 3				
1.3	Synonyms:	NA	WHMIS:			
1.4	Trade Names:	CaiKote™ 44, Conductive Silver Coating				
1.5	Product Use:	NA	HEALTH:			1
1.6	Manufacturer's Name:	CAIG Laboratories, Inc.	FLAMMABILITY:			1
1.7	Manufacturer's Address:	12200 Thatcher Court, Poway, CA 92064-6876	PHYSICAL HAZARDS:			0
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:	CaiKote™ 44, K-CK44-1, Liquid, 1 gram CaiKote™ 44, CK-44-8, Liquid, 226 grams				

2. HAZARD IDENTIFICATION

2.1	Hazard Identification: This product is classified as a HAZARDOUS SUBSTANCE but not as DANGEROUS GOODS according to the classification criteria of NOHSC: 1008 (2004) and ADG Code (Australia). WARNING! - Toxic if swallowed, inhaled or absorbed through skin. Unnecessary prolonged or excessive personal contact should be avoided. Intentional misuse by concentrating and inhaling contents can be harmful or fatal. This product is lead free.						
2.2	Routes of Entry:	Inhalation:	YES	Absorption:	YES	Ingestion:	YES
2.3	Effects of Exposure: EYES: Mild to moderate irritation. SKIN: Irritant and potential skin sensitizer. Prolonged or repeated contact may cause contact dermatitis (localized redness or rash). INGESTION: Gastrointestinal irritation and central nervous system depression. INHALATION: Central nervous system depressant. Irritating to the upper respiratory tract.						
2.4	Symptoms of Overexposure: EYES: Mild irritation, redness, and watering. SKIN: Contact dermatitis, characterized by localized red or puffy dry skin and itching. INGESTION: Nausea, vomiting, and diarrhea. INHALATION: Mouth, nose, and throat irritation, dizziness, nausea, light-headedness, drunkenness, and loss of coordination.						
2.5	Acute Health Effects: INGESTION: Gastrointestinal irritation and central nervous system depression. EYES: Mild to moderate irritation. SKIN: Irritant and potential skin sensitizer. Prolonged or repeated contact may cause contact dermatitis (localized redness or rash). INGESTION: Gastrointestinal irritation and central nervous system depression. INHALATION: Central nervous system depressant. Irritating to the upper respiratory tract.						
2.6	Chronic Health Effects: This product contains silver metal. Exposure to silver may cause argyria, a blue-gray discoloration of the eyes, skin, mucous membranes and upper respiratory tract. This product contains diethylene glycol monoethyl ether acetate which has been shown to cause adverse effects on the kidneys and liver. The carbon black component is listed as an (IARC) group 2B potential carcinogen.						
2.7	Target Organs: Eyes, skin, blood, and respiratory system.						

NA = Not Available; ND = Not Determined; NE = Not Established; NF = Not Found; 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 Z400.1-2004 format.



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3. COMPOSITION & INGREDIENT INFORMATION

CHEMICAL NAME(S)	CAS No.	RTECS No.	EINECS No.	%	EXPOSURE LIMITS IN AIR (mg/m ³)									
					ACGIH		NOHSC			OSHA			OTHER	
					ppm		ppm			ppm				
					TLV	STEL	ES-TWA	ES-STEL	ES-PEAK	TLV	STEL	IDLH		
SILVER	7440-22-4	VW350000	231-131-3	60-70	0.1	NA	.01	NF	NF		0.01	NA	10	DUST
CARBON	7440-44-0	FF5250100	231-153-3	< 40.0	NA	NA	NF	NF	NF		NA	NA	NA	
DIMETHYL GLUTARATE	1119-40-0	NA	214-277-2	< 40.0	NA	NA	NF	NF	NF		NA	NA	NA	
DIMETHYL SUCCINATE	106-65-0	WM6765000	203-419-9	< 20.0	NA	NA	NF	NF	NF		NA	NA	NA	
DIMETHYL ADIPATE	627-93-0	AV1645000	211-020-6	< 10.0	NA	NA	NF	NF	NF		NA	NA	NA	
PROPRIETARY RESINS	NA	NA	NA	< 10.0	NA	NA	NF	NF	NF		NA	NA	NA	

4. FIRST AID MEASURES

4.1	<p>First Aid:</p> <p>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.</p> <p>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.</p> <p>INGESTION: If swallowed, wash out mouth with water provided person is conscious. Call Poison Control for further instructions. DO NOT INDUCE VOMITING. Contact a physician.</p> <p>INHALATION: Remove victim to fresh air at once. If breathing is difficult, administer supplemental oxygen and seek immediate medical attention. If breathing stops, perform artificial respiration.</p>										
4.2	<p>Medical Conditions Aggravated by Exposure:</p> <p>None reported by the manufacturer.</p> <table border="1" style="width: 100%;"> <tr> <td style="background-color: #0000FF; color: white;">HEALTH</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="background-color: #FF0000; color: white;">FLAMMABILITY</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="background-color: #FFA500; color: white;">PHYSICAL HAZARDS</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="2">PROTECTIVE EQUIPMENT</td> </tr> <tr> <td>EYES</td> <td>SKIN</td> </tr> </table>	HEALTH	1	FLAMMABILITY	1	PHYSICAL HAZARDS	0	PROTECTIVE EQUIPMENT		EYES	SKIN
HEALTH	1										
FLAMMABILITY	1										
PHYSICAL HAZARDS	0										
PROTECTIVE EQUIPMENT											
EYES	SKIN										

5. FIREFIGHTING MEASURES

5.1	Flashpoint & Method: 100 °C (212 °F)
5.2	Autoignition Temperature: NA
5.3	Flammability Limits: Lower Explosive Limit (LEL): NA Upper Explosive Limit (UEL): NA
5.4	Fire & Explosion Hazards: Emits carbon monoxide, carbon dioxide and other toxic fumes when burning.
5.5	Extinguishing Methods: Carbon dioxide, dry chemical, foam, and halon. Use extinguishing agents suitable for class B fires.
5.6	Firefighting Procedures: Wear NIOSH/MSHA approved self-contained breathing apparatus and protective clothing. Fight from a maximum distance or use unmanned hose holders or monitor nozzles. Use a water spray to cool containers involved in fire. Do not use direct water stream. Container storage areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Keep containers cool until well after the fire is out to prevent rupture. Prevent runoff from fire control or dilution from entering sewers, drains, drinking water supply, or any natural waterway.



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6. ACCIDENTAL RELEASE MEASURES

- 6.1 Spills:
- SMALL SPILLS:** Secure spill area, and maximize ventilation. Stop spill at source if safely possible. Deny entry to all unprotected individuals. Individuals involved in the cleanup must wear appropriate personal protective equipment. Do not touch or walk through spilled material. Stop leak if you can do it without risk. It is recommended that measures be taken to monitor the spill area in the event that TLV levels exceed the exposure limits. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- LARGE SPILLS:** Secure spill area, and maximize ventilation. Dike far ahead of spill for later disposal. Stop spill at source if safely possible. Deny entry to all unprotected individuals. Individuals involved in the cleanup must wear appropriate personal protective equipment. Do not touch or walk through spilled material. Stop leak if you can do it without risk. It is recommended that measures be taken to monitor the spill area in the event that TLV levels exceed the exposure limits. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material.
- MITIGATION and DISPOSAL:** Recover spill material and place into appropriate container(s) for disposal. Contact appropriate local, state and federal authorities for assistance and/or requirements.

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. Avoid breathing mist. Eliminate all possible sources of ignition.
- 7.2 Storage & Handling:
Store at temperatures 50 °F (10 °C). Keep away from freezing. Keep container closed. Loosen closure cautiously before opening. Keep away from direct sunlight, heat, sparks, open flame, and other sources of ignition. Use only with adequate ventilation. Avoid breathing mist.
- 7.3 Special Precautions:
Empty containers retain hazardous properties. Do not cut, drill, grind, weld or perform similar operations on or near containers. Avoid breathing mist.

8. EXPOSURE CONTROLS & PERSONAL PROTECTION

- 8.1 Ventilation & Engineering Controls:
Provide general dilution ventilation or local exhaust as needed to keep vapor concentrations in the air as low as possible. Local exhaust is essential for spraying operations. Ensure appropriate decontamination equipment is available (e.g., sink, safety shower, eye-wash station).
- 8.2 Respiratory Protection:
In restricted ventilation areas use NIOSH approved chemical cartridge respirators for vapors or combination chemical cartridge and spray mist filters for mist from spraying. In confined areas or in case of very high concentrations, as from indoor spills, use NIOSH approved air supply or self-contained breathing apparatus.
- 8.3 Eye Protection:
Avoid eye contact. Splash proof chemical goggles or equivalent should be used when handling this product. (ANSI Z87).
- 8.4 Hand Protection:
Impermeable gloves required.
- 8.5 Body Protection:
Use as necessary to prevent skin contact. Ensure appropriate decontamination equipment is available (e.g., sink, safety shower, eye-wash station).



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9. PHYSICAL & CHEMICAL PROPERTIES

9.1	Density:	NA
9.2	Boiling Point:	196-212 °C (338-413 °F)
9.3	Melting Point:	NA
9.4	Evaporation Rate:	Slower than ethyl ether
9.5	Vapor Pressure:	0.10mm Hg @ 20 °C
9.6	Molecular Weight:	NA
9.7	Appearance & Color:	Thick silver colored paste, sweet odor.
9.8	Odor Threshold:	ND
9.9	Solubility:	Negligible
9.10	pH	NA
9.11	Viscosity:	NA
9.12	Other Information:	NVC 50-70%

10. STABILITY & REACTIVITY

10.1	Stability:	Stable under normal storage and handling.
10.2	Hazardous Decomposition Products:	Combustion may yield carbon monoxide and/or carbon dioxide, and oxides of nitrogen.
10.3	Hazardous Polymerization:	Will not occur.
10.4	Conditions to Avoid:	Use or storage near open flames, sparks, high heat (>100 °F) or other heat sources, and proximity to incompatible substances and direct sunlight.
10.5	Incompatible Substances:	None listed by the manufacturer.

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 2.5
11.3	Chronic Toxicity:	See section 2.6
11.4	Suspected Carcinogen:	YES. Silver IARC Group 4: Substance non-classifiable with regard to carcinogenicity .Tumorigenic :See RTECS.
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 2.3
11.7	Biological Exposure Indices:	NE
11.8	Physician Recommendations:	Treat symptomatically.



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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.
12.4	Environmental Impact (Percent by Weight): NVC 60-70%

13. DISPOSAL CONSIDERATIONS

13.1	Waste Disposal: Dispose of in accordance with federal, state or local regulations.
13.2	Special Considerations: Care must be taken to prevent environmental contamination from the use of this material. The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state, federal and provincial regulations.

14. TRANSPORTATION INFORMATION

The basic description (ID Number, proper shipping name, hazard class & division, 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 (Ground): NOT REGULATED	
14.2	IATA (Air): NOT REGULATED	
14.3	IMDG (Ocean): NOT REGULATED	
14.4	TDGR (Canada): NOT REGULATED	
14.5	ADR/RID (EU): NOT REGULATED	
14.6	SCT (Mexico): NOT REGULATED	
14.7	ADGR (Australia): NOT REGULATED	

15. REGULATORY INFORMATION

15.1	U.S. EPA SARA Reporting Requirements: This material contains Silver which is subject to the reporting requirement of Section 313 of SARA Title III and 40 CFR Part 373.	
15.2	U.S. EPA SARA Threshold Planning Quantity: None of the chemicals in this product have a TPQ.	
15.3	U.S. EPA TSCA Inventory Status: All chemical substances of this product are listed on the TSCA inventory or are otherwise exempt from inventory status.	
15.4	U.S. EPA CERCLA Reportable Quantity (RQ): NA	
15.5	Other U.S. Federal Requirements: Silver is listed as a Priority Pollutant under the Clean Water Act. Silver is listed as a toxic pollutant under the Clean Water Act.	
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	U.S. State Regulatory Information: Silver can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, and Massachusetts. California No Significant Risk Level: None of the chemicals in this product are listed.	



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15. REGULATORY INFORMATION- continued

15.8 67/548/EEC (European Union) and Australia NOHSC:2011 (2003) Requirements:

The primary component of this product is listed in Annex I of EU Directive 67/548/EEC:

Silver: Xi (Irritant). R: 33 Danger of cumulative effects. S: 28-37-45 - After contact with skin, wash immediately with plenty of water. Wear suitable gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).



16. OTHER INFORMATION

16.1 Other Information:

WARNING! - Toxic if swallowed, inhaled or absorbed through skin.

16.2 Terms & Definitions:

See last page 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.

16.4 Prepared for:

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16.5 Prepared by:

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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



PERSONAL PROTECTION RATINGS:

A	
B	
C	
D	
E	
F	

G	
H	
I	
J	
K	
X	Consult your supervisor or S.O.P. for special handling directions.

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
NF	Not Found
ND	Not Determined
ML	Maximum Limit
SCBA	Self-Contained Breathing Apparatus

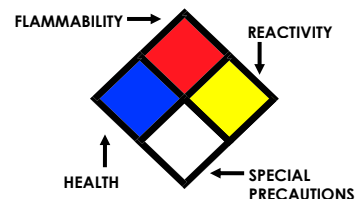
NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

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