



MATERIAL SAFETY DATA

CSL 541 Conformal Silicone Coating

Reviewed March 29, 2010

MSDS NO. 241

I PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME	CSL 541 Conformal Silicone Coating
CHEMICAL NAME	Not Applicable
CHEMICAL FORMULA	Silicone Sealant
MOLECULAR WEIGHT	Polymer
MATERIAL USES	Conformal Silicone Coating for electronics.
MANUFACTURER	CSL Silicones Inc. 144 Woodlawn Road West Guelph, ON N1H 1B5 Canada
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II HAZARDS IDENTIFICATION

A. HAZARDOUS INGREDIENTS OF MATERIAL

Methyl Ethyl Ketoxime (MEKO) is a curing by-product that is released when the sealant comes in contact with water or humid air. It is recommended to provide adequate ventilation to keep concentration below 3 ppm. TWA: 3 ppm, STEL: 10 ppm, Work place Environmental Exposure Level AIHA: 10 ppm.

B. EFFECTS OF CHRONIC EXPOSURE

Health Effects	Pulmonary Edema, Dermatitis
Toxicological Data	LD50 not established.
Carcinogenicity Data	The ingredients of this product are not listed as carcinogens by National Toxicology Program, and have not been evaluated by the International Agency for Research on Cancer or the American Conference of Government Industrial Hygienists.
Reproductive Data	Octamethylcyclotetrasiloxane (in concentration of 500 to 700 ppm) has shown reproductive effects in laboratory animals. No available information of adverse reproductive effects of other ingredients of this product
Mutagenicity Data	No information available and no adverse mutagenic effects are anticipated
Teratogenicity Data	No information available and no adverse teratogenic effects are anticipated
Synergistic Products	None Known
Delayed Effects	Curing by-product Methyl Ethyl Ketoxime (MEKO). Male rats and mice exposed to MEKO throughout their lifetime developed liver tumors. Many commonly used chemicals cause liver tumors in rats and mice. The relevance to humans is uncertain.

C. EFFECTS OF ACUTE EXPOSURE

Inhalation	Not normally an inhalation hazard. At high vapor concentration, curing by-product has a narcotic action with reversible effects.
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Eyes Moderate irritation. Can cause burns.
 Skin Mild irritant; may cause transient reddening of the skin.
 Ingestion Very low oral toxicity. May cause irritation and obstruction to gastro-intestinal tract.

D. HAZARD SYMBOLS



Harmful if swallowed

III COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	%	CAS NUMBER	ACGIH TLV	LD50
Oximino Silane	1-5	2224-33-1	Not Established	1.9 -2.5 mL/kg oral/rat
Amino Alkyl Silane	1-5	919-30-2	Not Established	Not Established
Octamethylcyclo-Tetrasiloxane	0.1-2	556-67-2	10 ppm	2000 mg/kg oral/rat 36 mg/L inhal/ rat 4 hrs

IV FIRST AID MEASURES

Inhalation No emergency care anticipated. Treat symptomatically. If symptoms persist, consult physician.

Eye Contact Do not attempt to physically remove solids or gums from eye. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes, by the clock, holding the eyelid(s) open. Obtain medical attention immediately.

Skin Contact Remove contaminated clothing. Wash gently and thoroughly with water and non-abrasive soap. If symptoms persist, obtain medical attention. Contaminated clothing should be laundered before re-use.

Ingestion Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. **DO NOT INDUCE VOMITING.** Have victim drink 8 to 10 oz. (240 to 300ml) of water or milk to dilute material in stomach. If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration. Repeat the administration of water/milk. Obtain medical attention immediately.

First Aid Provide general supportive measures (comfort, warmth, rest). Consult a physician and/or the nearest Poison Control Center for all exposures except minor instances of inhalation or skin contact. Solid or plastic material in the eye should be removed only by a physician.

V FIRE FIGHTING MEASURES

A. FIRE AND EXPLOSION DATA

Flash Point of Curing	Not Determined (not flammable)
By-Product and Method	Not Applicable
Lower Explosive Limit %	Not Applicable
Upper Explosive Limit %	Not Applicable
Autoignition Temperature	No Data
Fire Extinguishing Agents	Dry Chemical, CO2, Water fog
Unusual Fire/ Explosion Hazard	None
Hazardous Combustion Products	Carbon Dioxide, Carbon Monoxide, Silicon Dioxide, Nitrogen Oxides, Formaldehyde

B. FIRE FIGHTING PROCEDURES

Wear a Self Contained Breathing Apparatus (SCBA) which provides eye protection and is NIOSH approved. Sealant will burn if strongly heated. Water can be used to cool material below flash point.

VI ACCIDENTAL RELEASE MEASURES

Spill and Leak Procedure Restrict access to area of spill. Provide ventilation and protective clothing if needed. Scrape up sealant with cardboard or rag and place in a container.

Waste Disposal Review environmental regulations for disposal. Silicone wastes can often be incinerated in approved facilities. Solid waste may be sent to a designated landfill site.

VII HANDLING AND STORAGE

Storage Conditions Store in cool dry conditions. Keep container tightly sealed when not in use.

Handling Procedure No specific measures required. Do not inhale vapor or ingest sealant. Cured CSL product does not require special precautions.

VIII EXPOSURE CONTROL AND PERSONAL PROTECTION

Methyl ethyl ketoxime (MEKO) is released as a curing by-product when in contact with humid air.

EXPOSURE LIMIT OF CURING BY-PRODUCT

Component	OSHA PEL	ACGIH TLV	Other Limits
MEKO	None	None	10 ppm (STEL) 10 ppm (TWA)

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection Not required unless normal ventilation is inadequate.

Eye/Face Protection Chemical splash goggles

Skin Protection Gloves, coveralls, apron may be useful to prevent contamination of skin or clothing.

Resistance of Materials for Protective Clothing No specific data. Most rubbers and plastics are adequate.

Ventilation Requirements Local exhausts to provide sufficient removal of vapours.

IX PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Smooth, viscous liquid
Odour	Almost odourless
Odour Threshold	Not Applicable
pH	Not determined
Boiling Point (°C)	Not Applicable
Freezing Point (°C)	Not Applicable
Vapor Pressure (mm Hg)	Negligible @ 25°C.
Vapor Density (Air = 1)	Not Applicable
VOC Concentration	45.86 g/L (0.38 lb/gallon)
Specific Gravity (Water = 1)	0.99
Solubility in Water	Insoluble
Solubility in Other Solvents	Soluble in Most Organic Solvents
Evaporation Rate	Not Applicable

Decomposition Temperature **Not determined**

X STABILITY AND REACTIVITY

Product Stability	Stable
Hazardous Polymerization	Will not occur
Incompatible Materials	STRONG OXIDIZERS. CONCENTRATED ACIDS OR BASES cause degradation of polymer. Boiling water may soften and weaken material.
Hazardous Decomposition Products	Combustion will produce silicon dioxide, carbon dioxide, carbon monoxide and nitrogen oxides. A component of this product can generate formaldehyde at approximately 150° (300°F) and above in the atmosphere containing oxygen. Formaldehyde is a skin and respiratory sensitizer, eye and throat irritant, acute toxicant and potential carcinogen.

XI TOXICOLOGICAL INFORMATION

Toxicological Data **LD50 not established**

Evidence of reproductive effects of Octamethylcyclotetrasiloxane in laboratory animals at concentrations of 500 and 700 ppm

XII ECOLOGICAL INFORMATION

Sealant will release methyl ethyl ketoxime (MEKO) when in contact with water. MEKO has been determined to be biodegradable and has a static 96 hours LC₅₀ of 48 mg/L (bluegill) and 48 hours EC₅₀ of 750 mg/L (daphnia).

XIII DISPOSAL CONSIDERATION

Not classified as Hazardous Waste.

Review environmental regulations for disposal. Silicone wastes can often be incinerated in approved facilities. Solid waste may be sent to a designated landfill site.

XIV TRANSPORT INFORMATION

TDG Information **Not a regulated item.**

XV REGULATORY INFORMATION

Risk Phrases	R22 Harmful if swallowed. R36 Irritating to eyes. R43 May cause sensitization by skin contact.
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Safety Phrases	S23 Do not breath vapours S24/25 Avoid contact with skin and eyes S51 Use in well-ventilated areas
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WHMIS Classification	1. CLASS D-Poisonous and Infectious Material Division 2- Other Toxic Effects Subdivision A- Very toxic material 2. CLASS D-Poisonous and Infectious Material Division 2-Other Toxic Effects Subdivision B-Toxic material
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RoHS Statement	CSL 541 Conformal Silicone Coating does not contain Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent Chromium, Polybrominated Biphenyls
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(PBBs) and Polybrominated Diphenyl Ethers (PBDEs) as listed in RoHS Directives.

TSCA Status	All ingredients of this product are listed on TSCA Inventory of Chemicals.
State of California Safe Drinking Water And Toxic Enforcement Act 1986 (Proposition 65)	None of the ingredients of this product is listed on Proposition 65 list issued on December 2006.
Canadian DSL Status	All ingredients of this product are on the Canadian DSL.

XVI OTHER INFORMATION

Date Issued	August 9, 2007
Date Revised	March 29, 2010
Prepared By	Farooq Ahmed, Research and Development Manager
Emergency Contact	Baz Mistry, Laboratory Manager or Farooq Ahmed, Research and Development Manager

REFERENCES

1. American Conference of Governmental Industrial Hygienists Inc., Documentation of the Threshold Limit Values (TLV) and Biological Exposures Indices, 5th Edition, 1986, Cincinnati, OH.
2. National Institute for Occupational Safety and Health, Registry of Toxic Effects of Chemical Substances.
3. Sigma-Aldrich Corp., USA, The Sigma-Aldrich Library of Chemical Safety Data, 1985.
4. Sittig, M., handbook of Toxic and Hazardous Chemicals and Carcinogens, 2nd Edition, 1985, Park Ridge, NJ.
5. Canadian Center for Occupational Health and Safety, CHEMINFO, Record #15E, #26E.
6. Material Safety Data Sheets from Cabot Corporation, Wacker-Chemie GMBH, General Filtration, Dow Corning, Union Carbide, Hoechst Canada, Honeywell Chemicals.
7. Canada's National Occupational Health & Safety Resources at www.ccohs.ca/oshanswers/legisl/whmis
8. Information from Health Canada Website at www.hc-sc.gc.ca/ahc-asc/intactiv/ghs-sgh/index_e.html
9. Information from United Nations Website at www.unece.org/trans/danger/publi/ghs/ghs_rev01/01files_e.html
10. Information about RoHS (Restriction of Use of Certain Hazardous Substances in Electrical and Electronic Equipments) was obtained from Website at www.rohs.gov.uk
11. Information about State of California Safe Drinking Water and Toxic Enforcement Act 1986 (Proposition 65) was obtained from Website at www.oehha.ca.gov/prop65.html

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