



MATERIAL SAFETY DATA SHEET

Version 1.0
21OCT2008

1. Product and Company Information

Product Name **StressKote Brittle Coating, SK-75°F/24°C or SK-85°F/29°C**
CAS# Mixture

Company StressKote Brittle Coatings, LLC
Address S14 W33511 Hwy18, Bldg C
Delafield WI 53018 US

Technical Information 262-510-9568 or 414-940-1193
Fax 262-968-3050
Emergency 414-940-1193 or 414-322-3884
Product Use Coating for Mechanical Stress Analysis
OSHA Status Hazardous

Shipping Requirements (USDoT 49CFR, IATA)
Proper Shipping Name Dichloromethane Solution
Hazard Class, Division 6.1
Identification Number UN1593

2. Composition/Information on Ingredients

Wt %	Substance	CAS#
74-80	dichloromethane (methylene chloride)	75-09-2
6-10	toluene (toluol, methylbenzene)	108-88-3
1-3	dibutylphthalate (o-benzenedicarboxylic acid, dibutyl ester)	84-74-2
10-15	gum rosin resinates [Non-hazardous per OSHA: 29CFR 1910.1200]	

VOC: 80-86 wt %

3. Hazards Identification

The specific hazards associated with each of the StressKote Brittle Coatings depend upon its physical state as either the clear (non-turbid), reddish-orange liquid, as supplied, or as the dried, transparent copper colored film or coating. The liquid, which contains the volatile organic compounds, dichloromethane and toluene, has potential health effects primarily attributable to these two solvents, and to a much lesser extent, the gum rosin resinates and dibutyl phthalate. The dried brittle coating, containing the gum rosin resinates and dibutyl phthalate is believed not to pose a health risk to the end user, unless airborne dust, which can be inhaled, is generated during a mechanical removal (e.g., scraping, grinding, or wire brushing) of the coating from a substrate.

Emergency Overview

OSHA Hazards

Toxic. Target Organ Effect, Harmful by ingestion, Irritant, Possible carcinogen and teratogen. May cause harm to the unborn child.

Target Organs

Liver, kidneys, pancreas, eyes, blood

HMIS Classification

Health Hazard	2	
Flammability	1	(Self-extinguishing liquid. See section 5)
Physical Hazards	0	

NFPA Rating

Health Hazard	2	
Fire	1	(Self-extinguishing liquid)
Reactivity	0	

Potential Health Effects

Inhalation	May be harmful if inhaled, causing respiratory tract irritation. The liquid produces vapors which have a sweet, chlorinated hydrocarbon and pungent, aromatic hydrocarbon odor. These vapors, which are more dense than air, may cause at levels around 1000 ppm, drowsiness, dizziness, headache, nausea and vomiting, and if allowed to accumulate in poorly ventilated areas to concentrations as low as 10,000 ppm, can cause CNS depression, cardiac arrhythmia, unconsciousness and death. Dichloromethane is metabolized in the body producing carbon monoxide which increases and sustains carboxyhemoglobin levels in the blood, reducing the blood's oxygen-carrying capacity.
Skin	May be harmful if absorbed through skin. May cause skin irritation and discoloration, with prolonged contact causing redness, swelling and burns. Severe response may be experienced on covered skin (under clothing, gloves or jewelry), with attendant drying and flaking of the skin. May cause dermatitis.
Eyes	May cause eye irritation, conjunctivitis, and reversible corneal injury.
Ingestion	Low toxicity if small amounts are swallowed. Larger amounts will cause abdominal pain (gastrointestinal discomfort), nausea, diarrhea, and through aspiration may engender pneumonitis.
Cancer	None of the components of StressKote is believed to pose a measurable carcinogenic risk to man when handled as recommended.

4. First Aid Measures

General advice

Call the StressKote emergency numbers and consult a physician. Have a copy of this MSDS available for use by emergency response personnel.

If inhaled

If any of the potential health effects attributed to inhalation are observed, move the person into fresh air immediately. If breathing is labored, give oxygen. If not breathing, perform CPR. Consult a physician.

In case of skin contact

If any of the liquid StressKote brittle coating contacts the skin, immediately wipe the area with a clean cloth, then remove all residuals with soap and water. Consult a physician. Contaminated clothing must be removed immediately and washed or dry cleaned before reuse. If the clothing is heavily contaminated, it should be taken to a well-ventilated area to allow for the safe evaporation of the dichloromethane and toluene, then discarded appropriately.

In case of eye contact

If any of the liquid StressKote brittle coating splashes into the eye(s), or, for example, is transferred to the eye from a contaminated finger, then immediately flush the eye(s) [remove contact lenses] with clean water for 15 minutes, lifting the eye lids as necessary to ensure a complete rinse. Consult a physician, preferably an ophthalmologist.

If swallowed

Never give anything by mouth to an unconscious person. Do not induce vomiting, as vomiting will significantly increase the risk of aspiration causing pneumonitis. Rinse mouth with clean water. Consult a physician and transport the victim to an emergency care facility immediately.

5. Firefighting Measures
Flammable properties

Flash Point None

Flammable limits

Autoignition temperature

Hazardous combustion products

Suitable extinguishing media

Personal protective equipment

Self-extinguishing Liquid

The liquid StressKote does not exhibit a TCT flash point as defined by ASTM D56. A green halo, characteristic of thermal decomposition of dichloromethane is observed around the test flame even at temperatures approaching 0°F.

No determination made.

Literature values for the autoignition temperatures of dichloromethane, toluene and dibutyl phthalate, are 556°C (1,033°F), 536°C (997°F), and 404°C (759°F), respectively. A propane torch flame applied to the surface of liquid StressKote Brittle Coating will produce red-orange, sooty flames attributable primarily to burning toluene. However, upon removal of the torch flame, the liquid immediately self-extinguishes. The dried brittle coating is a combustible solid.

Carbon dioxide, carbon monoxide, hydrogen chloride, phosgene, smoke, fumes, unburned dichloromethane and hydrocarbons, aldehydes.

Water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Wear self-contained breathing apparatus, if necessary, and protective clothing and goggles to prevent contact with skin and eyes.

6. Accidental Release Measures

Personal precautions

Use personal protective equipment. Avoid breathing vapors, mist, gas, or dust. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapor accumulations in

low areas, e.g., workpits and basements.

Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not allow spillage to enter drains, sewers, and natural waterways.
Methods for cleaning up	Do not touch with unprotected hand or walk through spilled material. Contain spillage, then collect with clean absorbant towelling or sand, earth, diatomaceous earth, or vermiculite, and place the sorbed material in a container which will allow the drying of the liquid StressKote in a well-ventilated, unoccupied area. It is possible, the dried, sorbed brittle coating may be offered as ordinary industrial waste for disposal in accordance with local regulations. However, the end user (waste generator) should ensure the occluded dibutyl phthalate in the gum rosin resin matrix does not preclude the disposal of the dried material as ordinary industrial waste.

7. Handling and Storage

Handling

General handling	Avoid contact with eyes, skin and clothing. Avoid breathing vapor, mist, gas or dust. Do not swallow. Use only with adequate ventilation. Do not enter confined spaces in which liquid StressKote is being used or has recently been used, unless the space is adequately ventilated. As the vapors from liquid StressKote are more dense (heavier) than air, lethal concentrations of vapors can collect in low, confined and unventilated spaces such as tanks, workpits, small rooms, and basements. Do not enter these confined spaces where StressKote vapors are suspected unless special breathing apparatus is used and an observer is present for monitoring and assistance. Wash thoroughly after handling. Keep containers tightly closed when not in use. For the storage of liquid StressKote, use the metal containers provided in the original packaging or an equivalent container. When using the product, do not eat, drink or smoke. Take normal measures for preventative fire protection, which includes keeping sources of ignition (e.g. open flames and incendive electrostatic discharges) away from the liquid StressKote and its vapors, and dried StressKote films and coatings and any generated airborne dust.
Other precautions	Liquid StressKote containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near partial or empty containers. Uncapped emptied containers awaiting proper disposal should be placed in well-ventilated areas free of ignition hazards.

Storage	Store tightly closed containers of the liquid StressKote in a clean, dry, cool, well-ventilated place away from direct sunlight. Containers which have been opened must be carefully resealed and kept upright to prevent leakage.
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8. Exposure Controls/Personal Protection

Components with workplace control parameters

Abbreviations:	CAS	Chemical Abstracts Service, Registry Number
	ACGIH	US American Conference of Governmental and Industrial Hygienists

BEI	Biological Exposure Index
STEL	Short-term Exposure Limit
TLV TWA	Threshold Limit Value Time-Weighted Average
NIOSH	US Department of Health and Human Services - National Institute for Occupational Safety and Health
REL	NIOSH Recommended Exposure Limit
RTECS	Registry of Toxic Effects of Chemical Substances
OSHA	US Department of Labor-Occupational Safety and Health Administration
CEIL	Ceiling Limit
PEL	Permissible Exposure Limit (PEL)
MSHA	US Department of Labor, Mine Safety and Health Administration
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program

Component	CAS No.	Control	Parameter	Effective Date	Basis
dichloromethane (methylene chloride)	75-09-2	TWA	50 ppm 174 mg/m ³	1996-05-18	ACGIH TLV and BEI
		STEL	125 ppm	1997-04-04	OSHA 29CFR1910.1000 Z-1-A
		TWA	25 ppm	1997-04-04	OSHA 29CFR1910.1000 Z-1-A
		Action Level-Skin	12.5 ppm		OSHA
toluene	108-88-3	TWA	50 ppm 188 mg/m ³	1996-05-18	ACGIH TLV and BEI
		TWA	100 ppm 375 mg/m ³	1989-03-01	OSHA 29CFR1910.1000 Z-1-A
		STEL	150 ppm 560 mg/m ³	1993-06-30	OSHA 29CFR1910.1000 Z-1-A
		TWA	200 ppm	1993-06-30	OSHA 29CFR1910.1000 Z-2
		CEIL	300 ppm	1993-06-30	OSHA 29CFR1910.1000 Z-2
dibutyl phthalate	84-74-2	TWA	5 mg/m ³		ACGIH
		TWA	5 mg/m ³		MSHA
		TWA	5 mg/m ³		NIOSH
		PEL	5 mg/m ³ 8 hr TWA		OSHA

Personal protective equipment

Employ good industrial hygiene practices. Unless otherwise indicated, the following recommendations apply to both the Liquid StressKote and the dried StressKote in the form of airborne dust.

Engineering controls	Provide good ventilation (typically 10 air changes per hour) or other engineering controls to maintain airborne concentrations of vapors or mists below the applicable exposure limits indicated in the table above, and to safely expel any generated airborne dust. Exhaust systems should be designed to move the air away from the source of vapor/mist generation and personnel. All electrical equipment should comply with the National Electric Code. An emergency eye wash station and safety shower should be located near the work area where the StressKote is used.
Respiratory protection	Where risk assessment concludes an air-purifying respirator is appropriate, use a full-face respirator with a multi-purpose combination respirator cartridges as a backup to engineering controls (e.g., ventilation). If the respirator is the sole means of protection, use a full-face self-contained breathing apparatus or supplied air respirator. For protection against airborne dust which may be generated during the mechanical removal of dried StressKote films and coatings, a respirator specifically designed for particle entrapment is strongly recommended. Use respirators, accessories, and replaceable components which are tested and approved under germane government standards (e.g., NIOSH).
Hand protection	Avoid skin contact. Use heavy duty gloves made of chemical resistant materials such as Viton®, or butyl rubber. Wash hands with plenty of mild soap or dish detergent and water before eating, drinking, smoking, use of toilet facilities, or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners.
Eye protection	Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Chemical goggles should be worn during transfer operations or when misting, splashing, or spraying of the liquid StressKote. If exposure causes eye discomfort, use a full-face respirator.
Body protection	Use protective clothing chemically resistant to liquid StressKote. Selection of specific items such as face shield, boots, apron, or a full body suit will depend upon the product's use. If any of the liquid StressKote brittle coating contacts the skin, immediately wipe the area with a clean cloth, then remove all residuals with soap and water. Consult a physician. Contaminated clothing must be removed immediately and washed or dry cleaned before reuse. If the clothing is heavily contaminated, it should be taken to a well-ventilated area to allow for the safe evaporation of the dichloromethane and toluene, then discarded appropriately.
Ingestion	Avoid ingestion of even very small amounts. Do not consume or store food or tobacco in the work area. Wash hands and face before eating, drinking or smoking.

9. Physical and Chemical Properties

Appearance	Liquid StressKote is a clear (non-turbid), reddish-orange liquid, as supplied. The dried
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StressKote, as normally used for mechanical stress analysis, is a transparent copper colored film or coating.

Odor	Liquid StressKote produces vapors which have a sweet, chlorinated hydrocarbon and pungent, aromatic hydrocarbon odor. The dried intact coating is nearly odorless, but as a dust, has a pleasant gum rosin odor.		
pH	no measurements made on either the liquid or dried StressKote		
Melting point	The dried StressKote has a melting range of 145-160 °C. A melting (freezing) point for the liquid StressKote has not been measured.		
Boiling point	45.2°C (113°F) at 760 torr (normal bp).		
Flash point	None	The liquid StressKote does not exhibit a TCT flash point as defined by ASTM D56. A green halo, characteristic of thermal decomposition of dichloromethane is observed around the test flame even at temperatures approaching 0°F.	
Ignition temperature	400°C (750°F), estimated for the dried StressKote.		
Lower explosion limit	No determination made		
Upper explosion limit	No determination made		
Vapor pressure	42 kPa (315 torr, 0.41 atm) absolute at 20°C (68°F) and 80 kPa (600 torr, 0.79 atm) absolute at 37.8°C (100°F) for the liquid StressKote.		
Vapor density (air = 1)	3	(liquid StressKote vapor).	
Evaporation rate (acetone =1)	2		
Water solubility	The liquid Stresskote is miscible with water at concentrations less than 2% by weight (calculated), and the dried StressKote is insoluble.		
Density (20°C)	Liquid StressKote:	1.24 ± 0.02 g/ml	(H ₂ O 1.0 g/ml)
	Dried StressKote	1.06 ± 0.02 g/cm ³	

10. Stability and Reactivity

Storage stability	Stable under recommended storage conditions. Keep containers of liquid StressKote tightly closed in a clean, dry, cool, well-ventilated place away from direct sunlight. Containers which have been opened must be carefully resealed and kept upright to prevent leakage.
Conditions to avoid	Heat, flames and sparks.
Materials to avoid	Alkali metals (Na, K), strong oxidizing agents, strong bases, amines, powdered zinc, aluminum and magnesium. Water contamination may cause corrosion of ferrous metals due to the formation of hydrochloric acid.
Hazardous decomposition products	Hazardous decomposition products formed under fire

conditions: Carbon dioxide, carbon monoxide, hydrogen chloride, phosgene, smoke, fumes, unburned dichloromethane and hydrocarbons, aldehydes.

Hazardous reactions

Vapors in large, enclosed spaces may form explosive mixtures with air. Liquid StressKote does not undergo exothermic polymerization.

11. Toxicological Information

Dichloromethane, toluene and dibutyl phthalate, the three hazardous components of liquid StressKote, each have a unique set of oral, inhalation, and dermal toxicities. For each of the toxicity categories, the compound which has the highest value reported in the literature is considered to establish the toxicity of the mixture. Additional toxicity data may be available upon request.

Acute toxicity

Ingestion (Oral)	LD50, rat	1,500 mg/kg	(dichloromethane)
Inhalation	LC50, rat, 4hr	12,500 mg/m ³	(toluene)
Dermal	LD50, guinea pig	2,096 mg/kg	(dibutyl phthalate)
	LD50, rabbit	12,196 mg/kg	(toluene)

Irritation and corrosion

Skin	rabbit	skin irritation, 24 hr.	(dichloromethane)
Eyes	rabbit	severe irritation, 24 hr	(toluene)

Sensitization No data available

Chronic exposure

Carcinogenicity, rat	inhalation	(dichloromethane)
Tumorigenic:	Carcinogenic by RTECS criteria. Endocrine: Tumors	
Genotoxicity in vivo, rat	oral	(dichloromethane)
DNA damage	(dichloromethane)	
Developmental toxicity, rat	oral	Effects on embryo or fetus: Fetotoxicity (toluene)
Reproductive toxicity, rat	inhalation	Paternal effects: Spermatogenesis, including genetic material, sperm morphology, motility, and count (toluene)

Liquid StressKote contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, OSHA, or EPA classification.

IARC:	Group 2	The agent is possibly carcinogenic to humans (dichloromethane)
NTP:	Reasonably anticipated to be a human carcinogen (dichloromethane)	
OSHA:	19.101.052 (dichloromethane)	

None of the components of StressKote is believed to pose a measurable carcinogenic risk to man when handled as recommended.

Signs and symptoms of exposure

Dichloromethane	Dichloromethane is metabolized in the body producing carbon monoxide which increases and sustains carboxyhemoglobin levels in the blood, reducing the oxygen-carrying capacity of the blood. It acts as a simple asphyxiant by displacing air. Anaesthetic effects include difficulty in breathing, headache, and dizziness. Prolonged or repeated contact with skin may cause defatting, dermatitis. Contact with the eyes can cause redness, blurred vision, conjunctivitis, and tearing. Effects due to ingestion may include gastrointestinal discomfort, central nervous system depression, paresthesia, drowsiness, convulsions, pulmonary edema through aspiration. Effects may be delayed.
Toluene	Lung irritation, chest pain, pulmonary edema. Inhalation studies on toluene have demonstrated the development of inflammation and ulcerous lesions of the penis, prepuce, and scrotum in animals.
Dibutyl phthalate	Exposure can cause nausea, dizziness, and headache.
Potential health effects	See Section 3

12. Ecological Information

Elimination information (persistence and degradability)

Both the liquid and dried StressKote **should not** be considered biodegradable. The bioconcentration factor (BCF) for dichloromethane is 2- 40, and it has a very high potential for soil mobility. No other data are available.

Ecotoxicity effects

Toxicity to fish			
(dichloromethane)	96 hr LC50	fathead minnow	193 mg/l
	96 hr NOEC	sheepshead minnow	130 mg/l
(toluene)	96 hr LC50	bluegill	74-340 mg/l
	96 hr LC50	rainbow trout	7.63 mg/l
	7 d NOEC	fathead minnow	5.44 mg/l
	7 d LOEC	fathead minnow	8.04 mg/l
(dibutyl phthalate)	96 hr LC50	fathead minnow	0.92 mg/l
	96 hr LC50	rainbow trout	1.6 mg/l
	96 hr LC50	sheepshead minnow	≥0.6 mg/l
	96 hr LC50	bluegill sunfish	0.48 mg/l
Toxicity to daphnia			
(dichloromethane)	48 hr EC50	water flea	1,682 mg/l
(toluene)	24 hr EC50	water flea	8 mg/l
(dibutyl phthalate)	48 hr EC50	daphnid	3 mg/l

13. Disposal Considerations

Product DO NOT DUMP THE DRIED OR UNUSED LIQUID STRESSKOTE BRITTLE COATING INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. Observe all federal, state, and local environmental regulations. Regulations may vary with location. Waste

characterization and compliance with applicable laws are the sole responsibility of the waste generator. If you characterize unused liquid StressKote as waste, then contact a licensed professional waste disposal service to dispose of the material. Liquid StressKote may be destroyed by admixing with a combustible solvent and burning the mixture in a chemical incinerator equipped with an afterburner and scrubber. It is possible the dried StressKote may be offered as ordinary industrial waste for disposal in accordance with local regulations. However, you, the end-user (waste generator) should ensure the occluded dibutyl phthalate in the gum rosin resinate matrix does not preclude the disposal of the dried material as ordinary industrial waste. StressKote Brittle Coatings, LLC has no control over the management practices or procedures of parties handling or using liquid or dried StressKote.

Contaminated packaging Dispose of as dried StressKote.

14. Transport Information

Shipping descriptions may vary based upon mode of transport, quantities, package size, origin and/or destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.

US DoT	UN Number: 1593	Class: 6.1	Packing group: III
	Proper shipping name: Dichloromethane Solution		
IMDG	UN Number 1593	Class: 6.1	Packing group: III
	Proper shipping name: Dichloromethane Solution		EMS-No: F-A, S-A
	Marine pollutant: Yes, dibutyl phthalate		
IATA	UN Number: 1593	Class: 6.1	Packing group: III
	Proper shipping name: Dichloromethane Solution		

15. Regulatory Information

OSHA Hazards	Toxic. Target Organ Effect (liver, kidneys, pancreas, eyes, blood), Harmful by ingestion, Irritant, Possible carcinogen and tetraogen. May cause harm to unborn child.
TSCA Status	Dichloromethane, toluene, and dibutyl phthalate are TSCA Inventory items.
CEPA DSL Status	Dichloromethane, toluene, and dibutyl phthalate are listed on the Canadian Domestic Substances List (DSL) under the Canadian Environmental Protection Act (CEPA).
SARA 302 Components	No chemicals in StressKote are subject to the reporting requirements of the Superfund Amendments and Reauthorization Act, Title III, Section 302.
SARA 313 Components	Dichloromethane, toluene, and dibutyl phthalate are subject to SARA Section 313 reporting requirements, with De Minimis Limits of 0.1, 1.0, and 1.0, respectively. Therefore, both the liquid and dried StressKote may be subject to SARA Section 313 reporting requirements.
SARA 311/312 Hazards	StressKote contains both Acute and Chronic Health Hazards
Massachusetts Right To Know Components	Dichloromethane, toluene, dibutyl phthalate
Pennsylvania Right To Know Components	Dichloromethane, toluene, dibutyl phthalate

New Jersey Right To Know Components

Dichloromethane, toluene, dibutyl phthalate

California Proposition 65 Components

Dichloromethane, toluene, dibutyl phthalate
WARNING! This product contains a chemical known in the State of California to cause cancer.

16. Other Information

Disclaimer This product, StressKote brittle coating, is for industrial testing and/or R&D use only. StressKote Brittle Coatings, LLC does not approve the use of this product for direct sales to the general public. KEEP OUT OF REACH OF CHILDREN. StressKote Brittle Coatings, LLC does not recommend the use of this product in applications or in a manner WHERE: (1) soil or ground water contamination is likely, such as from spillage or intentional discharge to the ground, sink drains, sewers, or septic tanks, (2) inhalation overexposure is likely, such as in confined spaces where there is inadequate ventilation, (3) skin and/or eye contact is likely, (4) direct contact with food, drink or tobacco products is likely, (5) vapor levels and concentrations may represent an explosion hazard, (6) disposal of waste would present an environmental or health risk, or (7) chemical reactivity would pose a danger, e.g., contact with strong alkali or welding flames or sparks.

Warranty

StressKote Brittle Coatings, LLC strongly advises each customer or recipient of this MSDS to read and examine it carefully (peruse) and consult appropriate experts, if necessary, to fully understand the data contained and appreciate any hazards and risks associated with this product. The above information is provided in good faith and is believed to be correct as of the effective date shown, but does not purport to be all inclusive and shall be used only as a guide. No warranty nor any guarantee, expressed or implied, is given. Regulatory requirements are subject to change and may differ depending upon location. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented herein pertains to both the liquid StressKote, as shipped, and in part to the dried brittle coating. Because conditions for use of the product are not under control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. StressKote Brittle Coatings, LLC shall not be held liable for any damage resulting from the handling or use of the product. Copyright 2008 StressKote Brittle Coatings, LLC.