MATERIAL SAFETY DATA SHEET
A187 DLC®

Date Reviewed: September 26, 2011

SECTION 1 - PRODUCT IDENTIFICATION

TRADE NAME: A187 DLC
CHEMICAL NAME: gamma-Glycidoxypropyltrimethoxysilane on calcium silicate

HMIS RATING	
HEALTH	2
FLAMMABILITY	1
REACTIVITY	1

Company: NATROCHEM, INC.
P.O. Box 1205
Savannah, GA 31402-1205

Telephone Numbers:
Transportation Emergencies:
CHEMTREC (U.S.A.): (800) 424-9300 (24 hours)
CHEMTREC (International): (202) 483-7616 (24 hours, call collect)
Product Information: (912) 236-4464 (EST, 8:00AM – 4:00PM M-F)

SECTION 2 - HAZARDOUS INGREDIENTS

The component(s) listed below is identified as a hazardous chemical under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

INGREDIENT	CAS REGISTRY	PERCENT
Calcium Silicate	1344-95-2	26-30
gamma-Glycidoxypropyltrimethoxysilane	2530-83-8	70-74
Methanol	67-56-1	<0.2

SECTION 3 - PHYSICAL DATA

Boiling Point: 290º C (554 º F)
Vapor Pressure (mm Hg) : <1
Vapor Density (Air = 1) : >1
Solubility in Water: Reacts slowly
Appearance: Off-white, free flowing powder
Specific Gravity: 1.229
Percent Volatiles: N/DA
Evaporation Rate: <1
Odor: slight ester

SECTION 4 - FIRE & EXPLOSION DATA

FLASH POINT (Method Used): 110 º C (230º F) (PMCC)
FLAMMABLE LIMITS: N/D
AUTOIGNITION TEMPERATURE: N/D

EXTINGUISHING MEDIA: Use alcohol type or universal type foams applied by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical for small fires.

SPECIAL FIRE FIGHTING PROCEDURES: Use self-contained breathing apparatus when approaching fire from down-wind, or when fighting fire in an enclosed area; oxides of silicon may be evolved.

UNUSUAL FIRE & EXPLOSION HAZARDS: None.

SECTION 5 - PERMISSIBLE EXPOSURE LIMITS

Calcium Silicate: 5 mg/m3 respirable nuisance dust, OSHA. 10 mg/m3 total nuisance dust, ACGIH.

Methanol: 200 ppm (skin) 8 hr TWA, ACGIH and OSHA. 250 ppm STEL, ACGIH and OSHA

SECTION 6 - HEALTH HAZARD DATA

CHRONIC HEALTH EFFECTS: Prolonged or repeated exposure to excessive concentrations of this product dust or any nuisance dust can cause chronic pulmonary disease. Long-term repeated overexposure to methanol vapor concentrations of 3000 ppm or greater may allow a cumulative effect to occur with resulting nausea, vomiting, headache, ringing in the ears, insomnia, trembling, unsteady gait, vertigo, clouded and double vision. Liver and/or kidney injury may occur. Prolonged overexposure at levels of 800 - 1000 ppm may result in severe eye damage in some persons.
Repeated skin contact could result in a cumulative dermatitis.
Repeated contact could result in the development of an allergic contact dermatitis.

PRIMARY ROUTE OF ENTRY- Inhalation, dust contact with eyes, eye, skin, and skin absorption.

CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN: None.
NTP: No IARC: No OSHA: No

EFFECTS OF EXPOSURE-

EYES- Liquid causes pain in the eyes with excess blinking and discharge. There will be moderately severe conjunctivitis, seen as excess redness and swelling of the conjunctiva. Corneal injury may occur. Permanent impairment of vision may result if not promptly or adequately treated.

SKIN- Absorption. Causes local itching or discomfort with the development of moderate redness and swelling and possibly increased pigmentation of the skin.

SKIN ABSORPTION- Prolonged or widespread contact with the skin may result in the absorption of potentially harmful amounts of material.

INHALATION- Irritation and soreness in throat & nose. In extreme exposures, some congestion may occur. May cause transitory upper respiratory irritation. Methanol vapor may cause dizziness, drowsiness, disturbances of vision, and tingling, numbness, and shooting pains in the hands and forearms.

INGESTION- Nausea, abdominal pain, vomiting, headache, dizziness, shortness of breath, weakness, fatigue, leg cramps, restlessness, confusion, drunken behavior, visual disturbances, drowsiness, coma, and death. There may be a delay of several hours between swallowing methanol and the onset of signs and symptoms. The effects observed are in part due to acidosis and partially to cerebral edema. Visual effects include blurred vision, diplopia, changes in color perception, restriction of visual fields, complete blindness. Ingestion of moderate amounts of methanol also produces metabolic acidosis. Onset of symptoms may be delayed up to 48 hours. 60 - 200 ml of methanol is a fatal dose for most adults. Ingestion of as little as 10 ml has caused blindness. With massive overdoses, liver, kidney and heart muscle injury have been described.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE- Preexisting upper respiratory and lung disease such as, but not limited to bronchitis, emphysema and asthma. Due to its irritating effects, this material may aggravate an existing skin condition. Due to its liver and kidney-injuring potential, methanol may exacerbate existing liver and/or kidney diseases.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE REVELANCE TO HUMAN HEALTH HAZARD EVALUATION- This material was weakly mutagenic in the following in vitro procedures: Ames test, mouse lymphoma assay, and a sister chromatid exchange test. However, such in vitro mutagenic activity was reduced by exposing the material to homogenates of mammalian tissues. Detailed in vivo studies have shown that repeated exposure to this product, even at otherwise toxic doses, does not cause any mutagenic events. These findings indicate that this material can be biologically converted to product(s) which are not mutagenic, and thus, the material should not present a significant genetic hazard to the intact organism. This is confirmed by the lack of any local tumorigenic response to the chronic recurrent application of the material to the skin of mice.
In a developmental toxicity study with rats given the material by gavage over the period of organogenesis, the only effect was minimal fetotoxicity at 3000 mg/kg/day (reduced ossification at one site) in the presence of maternal toxicity. There were no embryotoxic or teratogenic effects. No effects were seen at 500 and 1500 mg/kg/day.
Recurrent exposure of rats to a respirable aerosol of a hydrolyzate of the product did not cause any respiratory tract injury or evidence of systemic toxicity.

SECTION 7 - EMERGENCY & FIRST AID PROCEDURES

EYE CONTACT: Immediately rinse with clean water for 15 minutes. Retract eyelids often. Get medical care, preferably an ophthalmologist, urgently.

SKIN CONTACT: Immediately remove contaminated clothing. Wash skin thoroughly with mild soap and water. Flush with lukewarm water for 15 minutes. Seek medical attention if ill effect or irritation develops.

INHALATION: If overcome by exposure, remove victim to fresh air. Call a physician immediately.

INGESTION: If patient is fully conscious, give two glasses of water. Induce vomiting. Obtain medical attention without delay. If medical advice is delayed, give three to four ounces of hard liquor, such as whiskey.

NOTES TO PHYSICIAN: This product reacts with moisture in the acid contents of the stomach to form methanol. The combination of visual disturbances, metabolic acidosis, and formic acid in the urine is evidence of methanol poisoning. The therapeutic intravenous administration of ethanol (10 ml/hr) allows it to be preferentially oxidized and reduces production of methanol metabolites. Acidosis must be treated by means of intravenous sodium bicarbonate, and methanol elimination may be increased by hemodialysis, as indicated. Treatment should be based on blood methanol levels and acid-base balance. Folates may be administered to enhance the metabolism of formaldehyde. 4-Methyl pyrazole has been suggested as an antidote; because of its alcohol dehydrogenase inhibiting effects, it reduces the production of formate and the development of metabolic acidosis. However, the value of this antidote remains to be proven in humans.

SECTION 8 - REACTIVITY DATA

STABILITY: Stable
MATERIALS TO AVOID- Calcium Silicate: Hydrofluoric Acid. Silane A187: Avoid strong oxidizing agents. Methanol may be formed in the presence of water.

CONDITIONS TO AVOID- Silicon Dioxide: Avoid high temperatures (>800º C) treatment. Silane A187: The epoxy silane esters are not monomers in the usual sense, but polymeric materials may be produced under certain conditions of catalyzed partial hydrolysis.

HAZARDOUS DECOMPOSITION PRODUCTS: Burning can produce oxides of carbon and oxides of silicon. Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant. Acute overexposure to the products of combustion may result in irritation of the respiratory tract.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 9 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: MINIMIZE SPILL AREA. Vacuum spill material and place in closed plastic bags for disposal. Toxic to fish; avoid discharge to natural waterways.

WASTE DISPOSAL METHOD: Incinerate in a furnace in accordance with local, state, and federal regulations.

SECTION 10 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use a respirator such as 3M 9900 or equivalent for protection against pneumoconiosis producing dusts.

VENTILATION: Provide explosion proof ventilation as required to control airborne dust levels. The sum total of all ingredients may emit vapors during normal processing. All possible health effects are not known and individual sensitivities will vary. Effective exhaust ventilation should always be provided to draw dust, fumes and vapors away from workers to prevent routine inhalation. Ventilation should be adequate to maintain ambient workplace atmosphere below the limits listed in Section V.

PROTECTIVE GLOVES: Impervious gloves to protect against contact with product.

EYE PROTECTION: Safety goggles.

OTHER PROTECTIVE EQUIPMENT: Protective clothing, eye wash station, safety shower.

SECTION 11 - SPECIAL PRECAUTIONS

HANDLING AND STORAGE: DANGER!! Harmful or fatal is swallowed * Harmful if absorbed through skin * Causes eye burns and skin irritation * May cause allergic skin reaction * May cause eye damage and blindness if swallowed * May cause dizziness and drowsiness * May cause heart muscle damage * May cause kidney and liver damage.

Handling can create explosive dust clouds. Eliminate ignition sources, use explosive proof equipment. Conveying and processing equipment should be spark-proof, well bonded and grounded. Avoid dust accumulations.

OTHER PRECAUTIONS: Polymerization-hydrolysis: The epoxy silane esters are not monomers in the usual sense, but polymeric materials may be produced under certain conditions of catalyzed partial hydrolysis.

Polysiloxanes are produced by polymerization of the silyl ester group in the presence of controlled amounts of water and alkali or acid catalyst at ambient temperatures. At slightly higher temperatures (ca. 50º C), polyglycols or polyglycol ethers are produced via the epoxy functional group under the same conditions of water concentration and alkali or acid catalyst.
Inasmuch as both of these reactions are exothermic and may occur simultaneously, the heat evolved may be cumulative and greatly accelerate the rate of reactions. It is imperative, therefore, that unintentional contamination of the epoxy silane esters with water be avoided and that intentional hydrolysis be properly controlled to avoid hazardous consequences.

DANGER! POISON! Harmful or fatal is swallowed, due to methanol production in the stomach.

WARNING! Hot organic chemical vapors or mists are susceptible to sudden spontaneous combustion when mixed with air. Ignition may occur at temperatures below those published in the literature as "autoignition" or "ignition" temperatures. Ignition temperatures decreases with increasing vapor volume and vapor/air contact time, and are influenced by pressure changes.

Ignition may occur at typical elevated-temperature process conditions, especially in processes operating under vacuum if subjected to sudden ingress of air, or outside process equipment operating under elevated pressure if sudden escape of vapors or mists to the atmosphere occurs.

Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained.

Wash with soap and water before eating, drinking, smoking, or using toilet facilities. Launder contaminated clothing before reuse.

SECTION 12 - ENVIRONMENTAL INFORMATION

This product does not contain toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372).

This information must be included in all MSDS' that are copied and distributed for this material.
THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUES:
Reportable Quantity (RQ), EPA Regulation 40 CFR 302 (CERCLA Section 102):
No RQ for product or any constituent greater than 1% or 0.1% (carcinogen).
Threshold Planning Quantity (TPQ), EPA Regulation 40 CFR 355 (SARA Sections 301-313):
No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

SECTION 13 - ENVIRONMENTAL INFORMATION

Hazardous Chemical Reporting, EPA Regulation 40 CFR 370 (SARA Sections 311-312):

Calcium Silicate- Immediate & Delayed Health Hazard
A187- Immediate & Delayed Health Hazard
The components of this product are included on the TSCA Chemical Substance Inventory.
TRANSPORTATION: Not regulated.

SECTION 14 - OTHER INFORMATION

Revision Note: Review and reissue. Prepared by: Craig Moore

N/A = Not applicable N/D = Not determined N/DA = No Data Available N/E = Not established

The information given in this MSDS was obtained from sources which we believe are reliable. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control, Natrochem, Inc. makes no warranty express or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon.