1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Silquest A-174® silane

Chemical name: Gamma-Methacryloxypropyltrimethoxysilane

Supplier: GE Silicones
3500 South State Route 2
Friendly, WV 26146, USA

Contact numbers:
CHEMTREC (24 hours): 800-424-9300
GE Silicones Emergency Response (24 hours): 800-809-9998
GE Silicones Emergency Response (24 hours): 304-926-8418
For Product Safety Inquiries: 304-652-8446
For MSDS only: 304-652-8155
Customer Service: 800-523-5862

2. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS#</th>
<th>CONCENTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma-Methacryloxypropyltrimethoxysilane</td>
<td>2530-85-0</td>
<td>&gt; 98.0 %</td>
</tr>
<tr>
<td>Related silanes</td>
<td>Not established</td>
<td>&lt; 2.0 %</td>
</tr>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>&lt; 0.2 %</td>
</tr>
</tbody>
</table>

Note(s): Additional methanol may be formed by reaction with moisture. See Section 15 for chemicals appearing on Federal or State Right-To-Know lists.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
DANGER!

HARMFUL OR FATAL IF SWALLOWED.
HARMFUL BY INHALATION OF MIST.
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 LIVER AND KIDNEY DAMAGE.

4. FIRST AID MEASURES

Swallowing
If patient is fully conscious, give two glasses of water. Induce vomiting. Obtain medical attention immediately. If
medical advice is delayed, and if the person has swallowed a moderate volume of material (50 ml or more), then give 100 ml of hard liquor, such as whiskey. For children, give proportionally less liquor, according to weight.

**Skin**
Remove contaminated clothing. Wash skin with soap and water. If irritation persists or if contact has been prolonged, obtain medical attention.

**Inhalation**
Remove to fresh air. Give artificial respiration if not breathing. If breathing is difficult, oxygen may be given by qualified personnel. Obtain medical attention.

**Eye contact**
Immediately flush eyes with water and continue washing for several minutes. Obtain medical attention.

**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 per hour) 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. Treatment of allergic skin reaction should be directed at control of the symptoms and clinical condition of the patient. Sensitized workers should avoid future handling of the material.

### 5. FIRE-FIGHTING MEASURES

**Flash point:** 108 °C (226 °F)

**Flammable limits**

- **Lower limit:** Not available
- **Upper limit:** Not available

**Special fire fighting procedures**

None.

**Special protective equipment for firefighters**

Self-contained breathing apparatus. Protective clothing.

**Extinguishing media**

- **Suitable:** Large fires:
  - alcohol-type foam or universal-type foams
  - CO2
  - dry chemical
- **Small fires:**
  - CO2
- **Unsuitable:** None.

**Unusual fire and explosion hazards**

None known.
6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear suitable protective equipment.

Environmental precautions
Toxic to aquatic life. Avoid drainage to sewers or natural waters.

Methods for cleaning up
Cover with absorbent or contain.
Collect for disposal.
Observe government regulations.

7. HANDLING AND STORAGE

HANDLING
Handling precautions
Do not swallow. Avoid breathing mist. Use with adequate ventilation. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.

Other precautions
DANGER!
Harmful or fatal if swallowed due to methanol production in the stomach.

STORAGE
Storage requirements
Keep container closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

PERSONAL PROTECTION
Respiratory protection
Self-contained breathing apparatus in high vapor concentrations. Mist respirator, if misting conditions exist.

Hand protection / protective gloves
Recommended order of use:
4H
Butyl
Neoprene
Nitrile (NBR)
PVC-coated

Eye protection
Safety glasses.

Other protective equipment
Eye bath
Safety shower
ENGINEERING CONTROLS
Ventilation
General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled in closed equipment. Special, local ventilation is needed at points where vapors can be expected to escape to the workplace air.

EXPOSURE LIMITS

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>TWA (skin), OSHA</td>
<td>200.0 ppm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STEL (skin), ACGIH</td>
<td>250.0 ppm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TWA (skin), ACGIH</td>
<td>200.0 ppm</td>
<td></td>
</tr>
</tbody>
</table>

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE
Physical state: Liquid
Color: Clear, pale
Odor: Ester

OTHER PROPERTIES
Boiling point: 255 °C at STP unless specified below.
Melting point: -48 °C at STP unless specified below.
pH: Not available
Specific gravity (H2O=1): 1.0450 at 25 °C (1,013 hPa)
Vapor pressure: < 1.33 hPa (1.00 mmHg) at 20 °C
Vapor density (air=1): Heavier than air
Solubility in water: Reacts slowly
Evaporation rate (Butyl Acetate=1): < 1
Flash point: 108 °C (226 °F)
Method: Tag Closed Cup
Upper explosion limits: Not available
Lower explosion limits: Not available
Percent volatiles: Not determined
10. STABILITY AND REACTIVITY

Stability: Stable.

Stability - Conditions to avoid
Heat.
Excessive temperatures.
Alkalis.
Metal salts.
Strong oxidizing agents.
Free radical initiators, such as peroxides.
May cause exothermic polymerization or degradation of the product.

Incompatible materials
Alkalis.
Metal salts.
Oxidizing agents.
Water.
Free radical initiators, such as peroxides.

Hazardous combustion products
Burning can produce the following combustion products:
Oxides of carbon.
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: May occur.

Hazardous polymerization - Conditions to avoid
Alkalis.
Metal salts.
Oxidizing agents.
Water.
Free radical initiators, such as peroxides.
They may cause an exothermic polymerization and/or decomposition.

11. TOXICOLOGICAL INFORMATION

SWALLOWING
Acute effects
Acute oral exposure (i.e., ingestion of significant quantities) during organogenesis may lead to increased reproductive risk.
This product hydrolyzes in the stomach to form methanol.
Methanol may cause 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 swallowiding 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 quantities of methanol also
Product name: Silquest A-174® silane

produces metabolic acidosis. Onset of symptoms may be delayed up to 48 hours. 60-200 ml methanol is fatal dose for most adults. Ingestion of as little as 10 ml methanol has caused blindness. With massive overdoses, liver, kidney and heart muscle injuries have been described.

Test results
Acute toxicity: LD50 - Rat
Result: > 2,000 mg/kg
Remark: very low order of toxicity

SKIN ABSORPTION
Acute effects
No evidence of harmful effects from available information.

Test results
Acute toxicity: LD50 - Rat
Result: > 2,000 mg/kg
Remark: very low order of toxicity

INHALATION
Acute effects
Short-term harmful health effects are not expected from vapor generated at ambient temperature. However, this material is capable of forming methanol if hydrolyzed. Methanol vapor may cause dizziness, drowsiness, disturbances of vision, and tingling, numbness, and shooting pains in the hands and forearms.

Effects of repeated overexposure
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.

SKIN CONTACT
Acute effects
May cause the following effects:
- allergic skin reaction in sensitized individuals
- hypersensitivity reactions
These reactions may be delayed.

Effects of repeated overexposure
Prolonged and/or repeated contact may result in:
- defatting of the skin
- drying of the skin

Test results
Skin irritation: Species: Rabbit
Result: Slight irritation

EYE CONTACT
Acute effects
May cause irritation.
May cause the following effects:
- stinging
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- excess blinking
- tear production
- excess redness of the conjunctivae
- swelling of the conjunctivae
May cause temporary superficial injury to the cornea.

Test results

Eye irritation: Species: Rabbit
Result: Mild irritation

Medical conditions aggravated by overexposure

May cause:
- an allergic skin reaction in sensitized individuals
May aggravate:
- an existing kidney disease
- an existing liver disease
Skin contact may aggravate:
- an existing dermatitis

Other effects of overexposure

None currently known.

SIGNIFICANT DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH

Inhalation studies in laboratory animals have shown that repeated exposures to high concentrations of a respirable, aqueous aerosol of the hydrolysis and condensation products of this material may cause a chronic inflammatory reaction in the larynx.

In vitro studies have shown this product not to be mutagenic, but a clastogenic effect was observed in cultured cells. The relevance of these findings to humans is unknown.

Dermal hypersensitivity testing involving extensive injection and topical exposure (Guinea Pig Maximization Study) suggested a slight potential for sensitization.

In a developmental study in rats, repeated oral gavage exposures to high concentrations during gestation resulted in significant maternal and fetal toxicity, including malformations. However, fetal effects were not observed in the absence of maternal toxicity. The no effect level for maternal and fetal effects was 0.5 ml/kg/day.

12. ECOLOGICAL INFORMATION

All available ecological data have been taken into account for the development of the hazard and precautionary information contained in this Safety Data Sheet.

13. DISPOSAL CONSIDERATIONS

General: Incinerate in a furnace where permitted under appropriate Federal, State, and local regulations.

14. TRANSPORT INFORMATION

DOT Classification
This product is not regulated by DOT.
Freight description road: SIZING, NOI
IMDG Classification
This product is not regulated by IMDG.

ICAO Classification
This product is not regulated by ICAO.

15. REGULATORY INFORMATION

Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of hazardous substances equal to or greater than the reportable quantities (RQ's) in 40CFR302.4.
Components present in this product at a level which could require reporting under the statute are:
**** NONE ****

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQ's) and release reporting based on Reportable Quantities (RQ's) in 40CFR355 (used for SARA 302 and 304).
Components present in this product at a level which could require reporting under the statute are:
**** NONE ****

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual reports of release of toxic chemicals that appear in 40CFR372 (for SARA 313). This information must be included in MSDS's that are copied and distributed for this material.
Components present in this product at a level which could require reporting under the statute are:
**** NONE ****

Massachusetts Right-To-Know Substance List (MSL)--Hazardous Substances and Extraordinarily Hazardous Substances on the MSL must be identified when present in products.
Components present in this product at a level which could require reporting under the statute are:
**** NONE ****

Pennsylvania Right-To-Know Hazardous Substance List--Hazardous Substances and Special Hazardous Substances on the list must be identified when present in products.
Components present in this product at a level which could require reporting under the statute are:
**** NONE ****

New Jersey Worker and Community Right-To-Know Act (Labeling Requirements)
<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS#</th>
<th>New Jersey TS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma-Methacryloxypropyltrimethoxysilane</td>
<td>2530-83-0</td>
<td>Not established</td>
</tr>
<tr>
<td>Related silanes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EPA Hazard Categories (SARA 311, 312): Immediate Health Hazard, Delayed Health Hazard

California Proposition 65
This product contains no levels of listed substances, which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute.

California SCAQMD Rule 443.1 VOC's
Volatile Organic Components (VOC's) = Substances with vapor pressure of => 0.5 mmHg at 104°C (219.2°F).
This product contains 1041.94 g/liter VOC's.
Product name: Silquest A-174® silane

CHEMICAL INVENTORY
Canada: The ingredients of this product are on the DSL.
Europe: The ingredients of this product are on the EINECS inventory.
United States: The components of this product are listed on the TSCA inventory or are exempt.
Australia: This product, or the components, is listed or exempt from listing on the Australian Inventory of Chemical Substances (AICS).
Japan: This product, or the components, is listed or exempt from listing on the Existing and New Chemical Substances (ENCS) list.
Korea: This product is listed on the Existing Chemicals List (ECL).

16. OTHER INFORMATION
RECOMMENDED USES AND RESTRICTIONS
Please consult the product and/or application information bulletins for this product.

HMIS RATING

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Reactivity</th>
<th>PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (HMIS)</td>
<td>Minimal hazard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (HMIS)</td>
<td>Slight hazard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (HMIS)</td>
<td>Moderate hazard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 (HMIS)</td>
<td>Serious hazard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 (HMIS)</td>
<td>Severe hazard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X (HMIS)</td>
<td>Personal protection rating to be supplied by user depending on use conditions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The opinions expressed herein are those of qualified experts within GE Silicones. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and of these opinions and the conditions of use of this product are not within the control of GE Silicones, it is the user’s obligation to determine the conditions of safe use of the products.