1. Identification

1.1. Product identifier

Trade name: Dynasylan® GLYMO
Chemical Name: [3-(2,3-epoxypropoxy)propyl]trimethoxysilane
CAS-No.: 2530-83-8

1.2. Recommended use of the chemical and restrictions on use

Relevant applications identified: For industrial use
Function: Coupling agent, Crosslinking agents, Surface modifier

1.3. Details of the supplier of the safety data sheet

Company: Evonik Corporation USA
299 Jefferson Road
Parsippany, NJ 07054-0677
USA

Telephone: 973-929-8000
Telefax: 973-929-8040
Email address: Product-Regulatory-Services@Evonik.com

1.4. 24 HOUR EMERGENCY TELEPHONE NUMBERS:

CHEMTREC - US & CANADA: 800-424-9300
CHEMTREC MEXICO: 01-800-681-9531
CHEMTREC INTERNATIONAL: +1 703-527-3887 (collect calls accepted)
Product Regulatory Services: 973-929-8060

2. Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation 29CFR 1910.1200
Eye irritation: Category 2A H319
Acute aquatic toxicity: Category 3 H402

2.2. Label elements

Classification according to Regulation 29CFR 1910.1200
SAFETY DATA SHEET
Dynasylan® GLYMO

Signal word Warning
Hazard statement
H319 - Causes serious eye irritation.
H402 - Harmful to aquatic life.
Precautionary statement:
Prevention
P264 - Wash skin thoroughly after handling.
P273 - Avoid release to the environment.
P280 - Wear eye protection/face protection.
Precautionary statement:
Reaction
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 - If eye irritation persists: Get medical advice/attention.
Precautionary statement:
Disposal
P501 - Dispose of contents/container to an approved waste disposal plant.

2.3. Other hazards
Hazards Not Otherwise Classified
None known

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tr>
<td>[3-(2,3-epoxypropoxy)propyl]trimethoxysilane</td>
<td>&lt;= 98%</td>
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</table>

CAS-No. 2530-83-8
Serious eye damage Category 1

Other information
This material is classified as hazardous under OSHA regulations.

4. First aid measures

4.1. Description of first aid measures

General advice
Take off all contaminated clothing immediately.

Inhalation
If aerosol or mists are formed:
Move victims into fresh air.
In case of persistent discomfort: Consult doctor immediately.

Skin contact
Wash off immediately with plenty of water.
Consult a doctor in the event of permanent skin irritation.

Eye contact
With eye held open, thoroughly rinse immediately with plenty of water for at least 10 minutes.
Continue rinsing process with eye rinsing solution.
Protect unharmed eye.
Call ambulance. (Cue: caustic burn of the eyes)
Immediate further treatment in eye clinic/eye doctor. Continue rinsing eye until arrival at ophthalmic hospital.

Ingestion
Have the mouth rinsed with water.
Only when patient fully conscious:
Have patient drink plenty of water in small sips.
Call a physician immediately.

4.2. **Most important symptoms and effects, both acute and delayed**

**Symptoms**
After absorbing large amounts of substance:
Liberation of reaction products (Methanol) can lead to symptoms of poisoning.
Possible signs of poisoning:
daze, dizziness, nausea, colicky abdominal pain, respiratory disturbance.
Symptoms upon increasing intoxication: dysopia, loss of eyesight.

4.3. **Indication of any immediate medical attention and special treatment needed**
If required, therapy of irritative effect.
Treatment:
Early endoscopy in order to assess mucosa lesions in the oesophagus and stomach which may appear. If necessary, aspirate leftover substance.
Detection of substance (Methanol) possible in:
Blood
Antidote treatment: ethanol.

5. **Fire-fighting measures**

5.1. **Extinguishing media**
Suitable extinguishing media: water spray, foam, Carbon dioxide (CO2), dry powder
Unsuitable extinguishing media: High volume water jet

5.2. **Special hazards arising from the substance or mixture**
Standard procedure for chemical fires.

5.3. **Advice for firefighters**
Water used to extinguish fire should not enter drainage systems, soil or stretches of water.
Ensure there are sufficient retaining facilities for water used to extinguish fire.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
As in any fire, wear self-contained positive-pressure breathing apparatus, (MSHA/NIOSH approved or equivalent) and full protective gear.

6. **Accidental release measures**

6.1. **Personal precautions, protective equipment and emergency procedures**
Do not inhale vapors / aerosols.

6.2. **Environmental precautions**
Obey relevant local, state, provincial and federal laws and regulations. Do not contaminate any lakes, streams, rivers, groundwater or soil.

6.3. **Methods and material for containment and cleaning up**
Soak up with absorbent material, e.g., sand, silica gel, acid binder, universal binder or sawdust. Place in a marked, sealable container and dispose of in accordance with existing federal, provincial, state and local regulations.

7. **Handling and storage**

7.1. **Precautions for safe handling**
Observe the rules usually applicable when handling chemicals. Provide good ventilation or extraction. Keep away from heat. Keep away from sparks, flames and other sources of ignition. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use with adequate ventilation. Ground and bond containers when transferring material. Use explosion-proof equipment. Follow all MSDS/label precautions even after the container is emptied because it may retain product residues. Wash thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion
Keep away from heat and from sources of ignition

Storage
Keep containers tightly closed in a cool, well-ventilated place. Protect from moisture.

8. Exposure controls/personal protection

8.1. Control parameters
Other information
Contains no substances with occupational exposure limit values.

8.2. Exposure controls

Engineering measures
Provide for good ventilation if vapors/aerosols are formed.

Personal protective equipment

Respiratory protection
A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 or applicable federal/provincial requirements must be followed whenever workplace conditions warrant respirator use. NIOSH's "Respirator Decision Logic" may be useful in determining the suitability of various types of respirators.

Hand protection
Glove material for example, butyl-rubber
Material thickness 0.5 mm
Break through time >= 480 min
Glove material for example, Fluorinated rubber (Viton)
Material thickness 0.4 mm
Break through time >= 480 min
Selection of protective gloves to meet the requirements of specific workplaces.
Suitability for specific workplaces should be clarified with protective glove manufacturers.
The above mentioned hand protection is based on knowledge of the chemistry and anticipated uses of this product but it may not be appropriate for all workplaces. A hazard assessment should be conducted prior to use to ensure suitability of gloves for specific work environments and processes prior to use. Use impermeable gloves.

Eye protection
Wear safety glasses with side shields.

Skin and body protection
A safety shower and eye wash fountain should be readily available.
To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a hazard assessment in accordance with the OSHA PPE Standard (29CFR1910.132) be conducted before using this product.

Hygiene measures
Avoid contact with skin, eyes and clothing. Do not inhale vapors or aerosols. Do not eat, drink, or smoke when using the product. Remove contaminated or saturated clothing.
9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

- **Physical state**: liquid
- **Colour**: colorless
- **Form**: liquid
- **Odour**: ester-like

- **Odour Threshold**: not determined
- **pH**: not determined
- **Melting point/range**: < -70 °C (literature value)
- **Boiling point/range**: 90 °C (0.7 hPa)  
  Method: DIN 51 356  
  262 °C (1013 hPa)  
  Method: DIN 51 356
- **Flash point**: 122 °C  
  Method: DIN EN ISO 2719 (Pensky-Martens, Closed Cup)
- **Evaporation rate**: not determined
- **Flammability (solid, gas)**: not determined
- **Lower explosion limit**: 0.7 % (V) (200 °C)  
  Method: DIN EN 1839
- **Upper explosion limit**: > 13.6 % (V) (200 °C)  
  Method: DIN EN 1839
- **Vapour pressure**: < 0.1 hPa (20 °C)
- **Density**: ca. 1.07 g/cm³ (20 °C)  
  Method: DIN 51757
- **Water solubility**: not miscible  
  Decomposition by hydrolysis
- **Partition coefficient: n-octanol/water**: log Pow: 0.5 (20 °C)
- **Autoignition temperature**: 400 °C  
  Method: DIN 51 794
- **Thermal decomposition**: not determined
- **Viscosity, dynamic**: 3.65 mPa.s (25 °C)  
  Method: DIN 53 015
9.2. Other information

Explosiveness: not explosive
Metal corrosion: Not to be expected in view of the structure

10. Stability and reactivity

10.1. Reactivity
No dangerous reaction known under conditions of normal use.

10.2. Chemical stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions
Possibility of hazardous reactions: Exothermic reaction with peroxides

10.4. Conditions to avoid
Protect from moisture.

10.5. Incompatible materials
Peroxides, water

10.6. Hazardous decomposition products
Methanol in case of hydrolysis.

11. Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity
LD50 Rat: 8025 mg/kg
Method: OECD Test Guideline 401
Possibly harmful.
(methanol in case of hydrolysis)

Acute inhalation toxicity
LC50 Rat: 5.3 mg/l / dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity
LD50 Rabbit: > 2000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Skin irritation
Rabbit
No skin irritation
Method: OECD Test Guideline 406

Eye irritation
Rabbit
Eye irritation
Method: OECD Test Guideline 405

Sensitization
Buehler Test Guinea pig: Does not cause skin sensitisation.
Method: OECD Test Guideline 406
### Repeated dose toxicity

**Oral Rat**
- **Testing period:** 28 d
- **NOAEL:** 500 mg/kg
- **Method:** OECD Test Guideline 407

**Inhalative Rat**
- **Testing period:** 14 d
- **NOAEL:** 0.225 mg/kg
- **Method:** OECD 412

#### Assessment of STOT single exposure
- **Assessment:** The substance or mixture is not classified as specific target organ toxicant, single exposure.

#### Assessment of STOT repeat exposure
- **Assessment:** The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

#### Risk of aspiration toxicity
- **No aspiration toxicity classification**

#### Genotoxicity in vitro
- **positive and negative**

#### Genotoxicity in vivo
- **positive and negative**

#### Carcinogenicity
- **Did not show carcinogenic effects in animal experiments.**

#### Carcinogenicity assessment
- **Contains no carcinogenic substances as defined by NTP, IARC and/or OSHA.**

#### Toxicity to reproduction
- **Animal model trials have produced no evidence of fertility damage.**

#### Further information
- Glycidoxypropyl trimethoxysilane administration by gavage to timed-pregnant rats during organogenesis resulted in maternal toxicity and slight fetotoxicity at 3000 mg/kg/day. No treatment-related malformation occurred at any dosage. The NOEL (No Observable Effect Level) for maternal toxicity as well as developmental toxicity was 1500 mg/kg/day for the specified study.

### Ecological information

#### Toxicity to fish
- **LC50 Cyprinus carpio:** 55 mg/l / 96 h
  - **Method:** Directive 92/69/EEC C.1
- **LC0 Cyprinus carpio:** 30 mg/l / 96 h
  - **Method:** Directive 92/69/EEC C.1

#### Toxicity in aquatic invertebrates
- **EC50 Daphnia magna:** 324 mg/l / 48 h
  - **Method:** US-EPA-method
- **NOEC Daphnia magna:** 100 mg/l / 21 d
  - **Method:** OECD 202 part 2

#### Toxicity to algae
- **EC50 Anabaena sp. (Algae):** 119 mg/l / 7 d
  - **Method:** US-EPA-method growth rate
NOEC Anabaena sp. (Algae): < 50 mg/l / 7 d
Method: US-EPA-method
growth rate

Toxicity to bacteria
NOEC Activated sludge: > 100 mg/l / 3 h
Method: OECD TG 209
tested in the presence of emulsifiers

12.2. Persistence and degradability
Biodegradability
Exposure time: 28 d
Result: 37 % Not readily biodegradable.
Method: (DOC; Die Away test - 79/831/EEC part C.4-A)

Physico-chemical removability
half-life period: 6.5 hrs
Method: OECD Test Guideline 111
Hydrolysis, abiotic decomposition

12.3. Bioaccumulative potential
Bioaccumulation
not bioaccumulative
log Pow: see chapter 9

12.4. Mobility in soil
Mobility
Adsorption on the floor: low.

12.5. Other adverse effects
Further Information
The data we have at our disposal do not necessitate identification concerning environmental hazard.

13. Disposal considerations
13.1. Waste treatment methods
Product
Waste must be disposed of in accordance with local, state, provincial and federal laws and regulations. Empty containers must be handled with care due to product residue.

Uncleaned packaging
Packaging, that can not be reused after cleaning must be disposed or recycled in accordance with all federal, national and local regulations.
If there is product residue in the emptied container, follow directions for handling on the container's label.
Incorrect disposal or reuse of this container is illegal and can be dangerous.
Other countries: observe the national regulations.

14. Transport information
Not dangerous according to transport regulations.

14.1. UN number: --
14.2. UN proper shipping name: --
14.3. Transport hazard class(es): --
14.4. Packing group: --
14.5. Environmental hazards (Marine pollutant): --
14.6. Special precautions for user: Yes
Not dangerous according to transport regulations.

15. Regulatory information

US Federal Regulations

OSHA
If listed below, chemical specific standards apply to the product or components:

- None listed

Clean Air Act Section (112)
If listed below, components present at or above the de minimus level are hazardous air pollutants:

- None listed

CERCLA Reportable Quantities
If listed below, a reportable quantity (RQ) applies to the product based on the percent of the named component:

- None listed

SARA Title III Section 311/312 Hazard Categories
The product meets the criteria only for the listed hazard classes:

- Acute Health Hazard

SARA Title III Section 313 Reportable Substances
If listed below, components are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

- None listed

Toxic Substances Control Act (TSCA)
If listed below, non-proprietary substances are subject to export notification under Section 12 (b) of TSCA:

- None listed
State Regulations

The Listing requirements of the Right to Know (RTK) legislation varies by state. All information for NJ, PA, MA and other states can be derived from the listing of hazardous and non-hazardous components in section 2 and 15 of this MSDS.

California Proposition 65

A warning under the California Drinking Water Act is required only if listed below:

- None listed

An employer using HMIS/NFPA labeling must through training ensure that its employees are fully aware of the hazards of the chemicals used.

HMIS Ratings

Health : 2
Flammability : 1
Physical Hazard : 1

NFPA Ratings

Health : 2
Flammability : 1
Reactivity : 1

16. Other information

Further information

Revision date: 05/26/2015

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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Legend

ACC: American Chemistry Council
ACGIH: American Conference of Governmental Industrial Hygenists
ACS: Advisory Committee on Sustainability
ADI: Acceptable Daily Intake
ASTM: American Society for Testing and Materials
ATP: Adaptation to Technical Progress
BCF: Bioconcentration factor
BOD: Biochemical oxygen demand
c.: closed cup
CAO: Cargo Aircraft Only
Carc: Carcinogen
CAS: Chemical Abstract Services
CDN: Canada
CEPA: Canadian Environmental Protection Act
CERCLA: Comprehensive Environmental Response – Compensation and Liability Act
CFR: Code of Federal Regulations
CMR: carcinogenic-mutagenic-toxic for reproduction
COD: Chemical oxygen demand
DIN: German Institute for Standardization
DMEL: Derived minimum effect level
DNEL: Derived no effect level
DOT: Department of Transportation
EC50: half maximal effective concentration
EPA: Environmental Protection Agency
ErC50: Reduction of Growth Rate
ERG: Emergency Response Guide Book
FDA: Food and Drug Administration
GHS: Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
GLP: Good Laboratory Practice
GMO: Genetic Modified Organism
HCS: Hazard Communication Standard
HMIS: Hazardous Materials Identification System
IARC: International Agency for Research on Cancer
ICAO: International Civil Aviation Organization
IATA: International Air Transport Association
IBC: Intermediate Bulk Container
ICAO-TI: International Civil Aviation Organization- Technical Instructions
ICCA: International Council of Chemical Association
ID: Identification number
IMDG: International Maritime Dangerous Goods
IUPAC: International Union of Pure and Applied Chemistry
ISO: International Organization For Standardization
LC50: 50 % Lethal Concentration
LD50: 50 % Lethal Dose
L(E)C50: LC50 or EC50
LOAEL: Lowest observed adverse effect level
LOEL: Lowest observed effect level
MARPOL: International Convention for the Prevention of Pollution from Ships
NFPA: National Fire Protection Association
NOAEL: No observed adverse effect level
NOEC: no observed effect concentration
NOEL: no observed effect level
o. c.: open cup
OECD: Organisation for Economic Cooperation and Development
OEL: Occupational Exposure Limit
OSHA: Occupational Safety and Health Administration
PBT: Persistent, bioaccumulative, toxic
PEC: Predicted effect concentration
PNEC: Predicted no effect concentration
RQ: Reportable Quantity
SDS: Safety Data Sheet
STOT: Specific Target Organ Toxicity
UN: United Nations
vPvB: very persistent, very bioaccumulative
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<th>Version</th>
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<tr>
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- **voc**: volatile organic compounds
- **WHMIS**: Workplace Hazardous Materials Information System
- **WHO**: World Health Organization