



8210 N. Austin Avenue, Morton Grove, IL 60053-3205, U.S.A.
 847-967-6000 800-323-8144
 (Monday - Friday: 7:30 a.m. - 4:00 p.m. CST)

Emergency Contact:
 INFOTRAC 800-535-5053 [U.S.A.]

Name: Deriva-Sil
 Code: 1-270048-200; 1-270048-500; 1-270151-200; 1-270152-200

..... **MATERIAL SAFETY DATA SHEET**

SECTION 1 **PRODUCT IDENTIFICATION**

- 1.1 Product Identifier
 - Name Deriva-Sil
 - Code 1-270048-200; 1-270048-500; 1-270151-200; 1-270152-200
- 1.2 Use of Substance/Mixture
 - Use Analytical Reagent—GC Derivatization; Silylation Reagent
- 1.3 Details of Manufacturer/Supplier
 - Company Regis Technologies, Inc.
 8210 N. Austin Avenue
 Morton Grove, IL 60053
 847-967-6000; 800-323-8144 (toll free)
 Email: cservice@registech.com
 www.registech.com
- 1.4 Emergency Telephone
 - INFOTRAC 800-535-5053 [U.S.A.]

SECTION 2 **HAZARDS IDENTIFICATION**

- 2.1 Classification of the Substance or Mixture
 - GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
 - Physical Hazards
 - Highly Flammable Liquid Category 2 H225
 - Health Hazards
 - Acute toxicity (oral) Category 4 H302
 - Acute toxicity (inhalation) Category 4 H332
 - Acute toxicity (dermal) Category 4 H312
 - Serious Eye Damage / Irritation Category 1C H314
 - Skin Corrosion / Irritation Category 1 H314
 - Specific Target Organ Toxicity – Single Exposure, Narcotic Effects Category 3 H336

GHS Label Elements

Pictograms or hazard symbols



Signal Word Danger

Hazard Statement

- H225 – Highly flammable liquid and vapor.
- H302 + H312 + H332 - Harmful if swallowed, inhaled or in contact with skin.
- H314 – Causes severe skin burns and eye damage.
- H336 – May cause drowsiness or dizziness.

Precautionary Statements

- [Prevention] P210 – Keep away from heat and hot surfaces.
- P233 – Keep container tightly closed.
- P243 – Take precautionary measures against static discharge.
- P261 – Avoid breathing mists/vapours.
- P264 – Wash thoroughly after handling.

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[Response] P280 – Wear protective gloves/protective clothing/eye protection/face protection.
 P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

[Storage] P313+P332+P337 – Get medical advice/attention if skin or eye irritation persists
 P402 + P404 + P403 + P235 – Store in a dry place. Store in a closed container, in a well-ventilated place, and keep cool.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Name Deriva-Sil
 Synonyms BSTFA + TMCS + TMSI + Pyridine (3:2:3:10 w/w/v); N,O-Bis(trimethylsilyl)trifluoro)acetamide, Trimethylsilylimidazole, and Trimethylchlorosilane in Pyridine
 CAS # No data available

Hazardous components

Component	Classification	Concentration (wt)
Pyridine CAS No. 110-86-1 EC-No. 203-809-9 Formula C ₅ H ₅ N Molecular Mass 79.10	Flam. Liq. 2; Acute Tox. 4; Skin Irr. 2; Eye Irr. 2A; STOT-SE 3; H225, H302 + H312 + H332, H315 + H519; H336	54%
BSTFA (N,O-Bis(trimethylsilyl)trifluoro)acetamide) CAS No. 25561-30-2 EC No. 247-103-9 Formula C ₈ H ₁₈ F ₃ NOSi ₂ Molecular Mass 257.40	Flam. Liq. 3; Skin Irr. 2; Eye Irr. 2A; H226, H315, H319	17%
TMSI (Trimethylsilylimidazole) CAS No. 18156-74-6 EC No. 242-040-3 Formula C ₆ H ₁₂ N ₂ Si Molecular Mass 140.26	Flam. Liq. 2; Skin Irr. 2A; Eye Irr. 2; H225, H315, H319	17%
TMCS (Trimethylchlorosilane) CAS No. 75-77-4 EC-No. 200-900-5 Formula C ₃ H ₉ ClSi Molecular Mass 108.64	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 4; Acute Tox. 3; Skin Corr. 1A; Eye Dam. 1; H225, H261, H301 + H331, H312, H314	13%

For full test of the H-Statements mentioned in this Section, see Section 16.

SECTION 4 FIRST AID MEASURES

4.1 Description of first aid measures
 General: This material may cause corrosive injury to any body tissue upon contact. Do not attempt to neutralize as it frequently makes matters worse.
 Inhalation: Remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and keep person warm and at rest. Consult physician.
 Skin contact: Immediately remove contaminated clothing and shoes, then wash skin with soap and plenty of water. If irritation persists or burns occur, consult physician.
 Eye contact: Rinse eyes with plenty of water for at least 15 minutes; lift eyelids occasionally. If irritation persists or burns occur, consult physician.

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- Ingestion: Give large amounts of water or milk (two glasses at most). Avoid vomiting. Consult physician immediately.
- 4.2 Most important symptoms and effects, both acute and delayed.
 Burns or severe irritation to body tissues - pain, tearing, redness, blurred vision, difficult breathing, shortness of breath, burning sensation, cough.
- 4.3 Indication of immediate medical attention and special treatment needed.
 No information available.

SECTION 5 FIRE FIGHTING MEASURES

- 5.1 Suitable Extinguishing Media
 Carbon dioxide, dry chemical powder, dry sand, foam.
 Water may be effective for cooling, but may not effect extinguishment for large fires.
 Water may be used to knock down corrosive vapor cloud down wind of fire and to keep fire exposed containers cool.
 Do not allow extinguishing media to enter container. Contact with water may generate flammable and corrosive chemicals.
- 5.2 Specific hazards arising from the chemical.
 Flammable and corrosive liquid and vapor.
 Hydrolyzes readily on contact with water, but **not violently** so, to produce hexamethyldisiloxane (flammable) and trifluoroacetamide, and imidazole. TMCS can readily react with water to form corrosive hydrochloric acid.
Chlorosilanes may cause re-ignition to occur. A fire guard should be posted during any clean up operation.
 Exposure to oxidizers or acids could start or accelerate fire conditions.
 Emits toxic fumes under fire conditions: carbon oxides, silicon oxides, nitrogen oxides, hydrogen fluoride, hydrogen chloride
- 5.3 Advice for fire-fighters
 Wear personal protective equipment for flammable and corrosive organic/acid/amine vapor conditions.

SECTION 6 ACCIDENTAL RELEASE MEASURES.....

- 6.1 Personal precautions, protective equipment, and emergency procedures
 For non-emergency personnel – Avoid material contact or inhalation of flammable or corrosive mists. Evacuate unnecessary personnel from area.

 For emergency responders – Wear protective clothing corrosive and flammable conditions to prevent contact with skin and eyes. Avoid breathing mists. Wear NIOSH/MSHA approved respirator for organic/acid/amine gas, dust, and mists to prevent inhalation. See Section 8.3.
- 6.2 Environmental precautions
 Prevent material from entering drains.
- 6.3 Methods of clean up
 Evacuate unnecessary people from area. Isolate spilled material.
 Ventilate area. Eliminate all ignition sources. Use spark proof tools.
 Keep away from water. Hydrolyzes readily on contact with water, but **not violently** so, to produce hexamethyldisiloxane (flammable) and trifluoroacetamide. TMCS can readily react with water to form corrosive hydrochloric acid.
 Contain and recover material when possible. Neutralize with sodium bicarbonate or other suitable neutralizing agent.
 If neat or in solution, mix with sand or similar inert adsorbent material or spill pillow. This will help blanket corrosive, flammable vapors.
 Sweep up, if not absorbed in pillow, seal in appropriate hazardous waste container, and hold for proper waste disposal.
 Keep out of water supplies and sewers. Wash spill site after material pickup is complete.
 Do not allow material to enter drains or watercourses.

SECTION 7 HANDLING AND STORAGE.....

- 7.1 Precautions for Safe Handling
Observe precautions in Section 2.

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Wear suitable protective equipment for flammables and corrosives to avoid contact with or inhalation of liquids or vapors. Handle under nitrogen. Protect from moisture. – Contact with water or moist air may readily generate hexamethyldisiloxane (flammable) and trifluoroacetamide, and possibly corrosive hydrochloric acid. Ground and bond containers or use inert gas purge when transferring or handling material. Use spark proof tools and explosion proof equipment. Empty containers retain product residue, (liquid/vapor), and can be dangerous.

7.2 Conditions for safe storage, including any incompatibilities
 Store in tinted glass bottle under nitrogen, in a cool, dry place with adequate ventilation, in area suitable for flammables and corrosives.
 Protect from light and heat. May be stored refrigerated.
 Store away from incompatible materials (See Section 10.).

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure limits:
 No limits are available for the mixture, BSTFA or TMSI.
 Pyridine (110-86-1) –
 OSHA – PEL 5 PPM (15 mg/m³) TWA
 ACGIH – TLV 1 PPM (3.2 mg/m³) TWA
 TMCS or Trimethylchlorosilane (75-77-4) –
 OSHA – PEL or ACGIH – TLV: No limits established.
 Dow Corning Guide – Ceiling Limit 5 ppm (7 mg/m³)
 Note: Hydrogen chloride [5ppm-(OSHA – PEL and NIOSH-REL); 2ppm (ACGIH – TLV)] is formed on contact with humid air or water
 Environmental Do not empty into drains.

8.2 Appropriate engineering controls
 Handle in accordance with good industrial hygiene and safety practice.
 Local exhaust and mechanical ventilation required. Hood recommended. Use adequate general and/or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Fume scrubber. Safety shower and eye wash.

8.3 Personal protection
 Eye/Face Tightly fitting safety glasses or safety goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US).
 Hand Compatible chemical-resistant gloves for acidic corrosives such as hydrochloric acid.
 Respiratory If exposure to mist or vapors likely: NIOSH/MSHA (US) approved respirator for organic/amine/acid vapor and mists.
 Dermal (not hand) Protective Clothing (e.g., lab coat)
 Hygiene Avoid inhalation, ingestion; contact with eyes, skin, and clothing; Avoid prolonged or repeated exposure. Remove contaminated clothing and discard contaminated footwear. Wash thoroughly after handling.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on physical and chemical data

Form	Liquid
Appearance	Colorless to pale yellow.
Odor	Sharp penetrating.
Odor threshold	No data available
pH	No data available
Melting/freezing point	No data available
Initial boiling point:	57.9°C (135°F)
Flammability (liquid)	

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Flash Point	<68°F; <20°C	Method: tcc
Flammable limits (%v/v)	UEL (upper explosive limit)	12.4%
	LEL (lower explosive limit)	0.8%
Autoignition temperature	No data available	
Decomposition temperature	No data available	
OSHA Flammability Class	IB	
Evaporation Rate (BuAc = 1.0)	No data available	
Vapor pressure (mmHg)	No data available	
Vapor density (air=1):	> 1	
Relative density (g/cm ³)	0.938	
Water Solubility/Reactive	Yes—Some solubility and decomposition. Water contact can readily form hydrochloric acid and, more slowly, form, contact with water can form hexamethyldisiloxane (flammable), trifluoroacetamide, and imidazole.	
Solubility (other)	No data available	
Partition coefficient: N-octanol/water	Kow (Pow) = No data available	
Viscosity, dynamic	No data available	

SECTION 10 STABILITY AND REACTIVITY

Stability

Stable if stored under nitrogen and protected from moisture.

Incompatibilities

Strong acids, acid chlorides, strong bases, alcohols, alkalis, amines
 Strong oxidizers--Fire/explosion hazard.

Water, moisture, or humid air--may decompose on contact: HMDS hydrolyzes to ammonia and TMCS hydrolyze to hydrochloric acid.

Precautions

Avoid incompatibilities.
 Protect from static, heat, flames, sparks, and ignition sources.
 Keep out of water supplies and sewers.

Hazardous Combustion or Decomposition Products

carbon oxides, silicon oxides, nitrogen oxides, formaldehyde, ammonia, cyanide, chlorinated compounds

Hazardous Polymerization

None

SECTION 11 TOXICOLOGICAL INFORMATION

11.1 Toxicological Information

Acute toxicity

Oral

No data available for mixture, BSTFA, or TMSI.
 Pyridine: 800 mg/kg < oral rat LD50₅₀ <1600 mg/kg (Verschuereen 1983)
 TMCS: oral rat LD50 100-300 mg/kg (IUCLID; No data available).

Inhalation LC50

No data available for mixture, BSTFA, or TMSI.
 Pyridine: inh rat LC_{Lo} 4900 ppm 4H (Kinney 1984); general depressed activity, respiratory depression, weight change
 TMCS: ihl rat LC50: 12.9 mg/L/1 hr (IUCLID; No data available).

Dermal LD50

No data available for mixture, BSTFA, or TMSI.
 Pyridine: skn gpg LD50 1 g/kg (Karger 1948); Pyridine is readily absorbed through skin.
 TMCS: skn rbt LD50:1780 uL/kg (RTECS; Altered sleep time (including change in righting reflex), Hypermobility, diarrhea, Weight change)

Other acute toxicity

Skin corrosion/irritation

No data available
 No data available

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Serious eye damage/irritation No data available
 Respiratory irritation No data available
 Respiratory or skin sensitization No data available
 Germ cell mutagenicity No data available
 Carcinogenicity
 IARC No data available
 NTP No data available
 OSHA No data available
 Other No data available
 TMSI: Mouse, intraperitoneal, TDLo 1g/kg – Tumorigenic-Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration-Tumors.
 Reproductive toxicity (Including teratogenicity) No data available
 Specific target organ toxicity (STOT)
 STOT-single exposure No data available
 STOT-repeated exposure No data available
 Aspiration hazard No data available
 RTECS Number No data available for mixture or BSTFA. RTECS number for TMSI is NI8700000, TMCS is VV2710000, and Pyridine is UR8400000.

11.2 Further Information

Potential health effects
 Eye Can cause eye burns, lacrimation, and destruction of mucous membranes.
 Skin Can cause severe irritation, dryness, and skin burns.
 Inhalation Can be extremely destructive to mucous membranes and respiratory tract.
 Symptoms: coughing, shortness of breath, difficulty breathing, headache.
 Ingestion Can be very destructive if in contact with mucous membranes of the GI system.
 Symptoms See above route. Pre-existing conditions that may be aggravated: not determined.
 Miscellaneous No data available.

SECTION 12 ECOLOGICAL INFORMATION

12.1 Ecotoxicity

No data available for mixture, BSTFA, TMSI, or TMCS.

Test Substance	Species	End Point	Result	Reference
Pyridine	Pimephales promelas (fathead minnow)	LC50	99 mg/L-96 hr	Broderius 1985
Pyridine	Daphnia magna (Water flea)	LC50	1165 mg/L-48 hr	Adema 1978
Pyridine	Daphnia magna (Water flea)	LC50	1755 mg/L-48 hr	Adema 1978
Pyridine	Daphnia magna (Water flea)	LC50	1130 mg/L-48 hr	Adema 1978
3-Methylpyridine	Selanastrum capricornutum (green agla)	EC50	320 mg/L/72 hr	Weytjens 1991
Pyridine	Tetrahymena sp.	LC100	113.8 mmol/L/24 hr	Verschuren 1983

12.2 Persistence and degradability No data available for mixture.
 12.3 Bioaccumulative potential No data available for mixture.
 Pyridine: BCF = 88 (Pyridine) (Devoogt 1991)
 Pyridine is expected to have low bioaccumulation potential and low persistence.
 12.4 Motility in soil No data available for mixture, BSTFA, TMSI, or TMCS.
 Pyridine: Log Kow = 0.65.
 12.5 Other adverse effects No data available.
 Do not discharge into the environment.

SECTION 13 DISPOSAL CONSIDERATIONS

13.1 Disposal methods

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U . S. EPA Waste Codes D001, D002
 Waste Characterization RCRA Hazard Class (40CFR 261): Ignitable, Corrosive
 (per U. S. regulations) Generator is responsible for proper waste characterization. NOTE: U. S. Federal and state hazardous waste regulations may differ considerably.
 Waste Disposal That which cannot be recovered or recycled, should be disposed of in accordance with all applicable international, national, regional, state, and local laws. Do NOT dump into any sewer, on ground, or into any body of water.

SECTION 14 TRANSPORT INFORMATION

14.1 UN number UN 2924
 14.2 UN proper shipping name Flammable liquids, corrosive, n.o.s., (pyridine, chlorotrimethylsilane).
 14.3 Transport Hazard Class 3+8
 14.5 Packing group PG II
 14.6 Environmental hazards Not applicable
 14.6 Special precautions for user See Section 8 for exposure/personal protection guidance.

SECTION 15 REGULATORY INFORMATION

15.1 Safety, health and Environmental regulations specific for the product in question.

NFPA: H3 F2 R1 W HMIS: H3* F2 PH1

15.2 Chemical Inventory Lists

Reviews, Standards, and Regulations

	Deriva-Sil*	BSTFA	TMCS	TMSI	Pyridine
	(Reagent)	25561-30-2	75-77-4	18156-74-6	110-86-1
TSCA:	NL	NL	Y	Y	Y
*This compound is sold strictly for research and development use.					
EINECS:	NL	Y	Y	Y	Y
Number	NL	247-102-9	200-900-5	242-040-3	203-809-9
CERCLA [Section 103 (40 CFR 302.4)]:	NL	NL	NL	NL	Y
RQ (lbs)	NA	NA	NA	NA	1,000
RCRA Waste Code	NA	NL	NA	NL	U196 (pure only)
OSHA Process Safety [29 CFR 1910.119]:	NL	NL	NL	NL	NL
TQ (lbs)	NA	NA	NA	NA	NA
Clean Air Act					
[Section 112r (40 CFR 68)]:	NL	NL	Y	NL	NL
TQ (lbs)	NA	NA	10,000	NA	NA
Contains Ozone Depleters (Class I or Class II)	N	N	N	N	N
[Section 103 (40 CFR 302.4)]:	NL	NL	NL	NL	NL
State Lists:	NL	NL	NL	NL	NL
States	NL	NL	FL,NJ	NL	CA,FL,PN PN,MA MA,MN
On CA 65 Significant Risk Level	NL	NL	NL	NL	NL
SARA Title III Notification [40 CFR 302.4]:					
Section 302/304 (EHS) Ingredient [40 CFR 355.3]:	NL	NL	Y	NL	NL
TPQ (lbs)	NA	NA	1,000	NA	NA
RQ (lbs)	NA	NA	1,000	NA	NA
Section 313 Ingredient [40 CFR 372.65]	NL	NL	Y	NL	Y

SECTION 16 OTHER INFORMATION

16.1 Full test of H-Statements referred to under Section 2 and 3.

Acute Tox. Acute toxicity

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Eye Dam.	Eye Damage
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H261	In contact with water releases flammable gases.
H302 + H312 + H332	Harmful if swallowed, inhaled or in contact with skin.
H314	Causes skin and serious eye irritation.
H336	May cause drowsiness or dizziness.
Skin Corr.	Skin Corrosion
STOT-SE	Specific Target Organ Toxicity – Single Exposure

16.2 Other

The above information is believed to be correct to the best of our present state knowledge, but does not purport to be all-inclusive and shall be used only as a guide. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.

This is the last page of this MSDS.