



8210 N. Austin Avenue, Morton Grove, IL 60053-0519, 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: Hydrox-Sil  
 Code: 270066, 270454, 270455, 270457

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

**SECTION 1 ..... PRODUCT IDENTIFICATION .....**

Name: Hydrox-Sil  
 Code: 270066, 270454, 270455, 270457

**SECTION 2 ..... COMPOSITION, INFORMATION ON INGREDIENTS .....**

*Synonyms*

HMDS + TMCS + Pyridine (2:1:10)  
 CAS #: 999-97-3      MF : C<sub>6</sub>H<sub>19</sub>NSi<sub>2</sub>      HMDS; 1,1,1,3,3,3-Hexamethyldisilazane  
 CAS #: 75-77-4      MF : C<sub>3</sub>H<sub>9</sub>ClSi      TMCS; Trimethylchlorosilane  
 CAS #: 110-86-1      MF : C<sub>5</sub>H<sub>5</sub>N      Pyridine

*Ingredients*

	<i>Concentration (%/wt)</i>
HMDS (999-97-3) .....	16.0 %
TMCS (75-77-4) .....	8.0 %
Pyridine (110-86-1) .....	77.0 %
Manufacturing Impurities.....	NA

**SECTION 3 ..... HAZARDS IDENTIFICATION .....**

*Precautionary Statements*

See Sections 8 and 11 for further details.

Flammable, corrosive, **readily absorbs through skin**

..... **Emergency Overview** .....

NFPA Ratings (Scale 0-4); Health = 3; Fire = 3; Reactivity = 2; ~~W~~ (avoid water)

Liquid: Clear to cloudy. Strong, pungent odor.

Corrosive, extremely flammable liquid and vapor. May cause flash fire. Keep away from ignition sources. Protect from static discharge. May decompose on contact with water. **Pyridine exposure level of 3600 ppm is immediately dangerous to life and health.** Hydrox-sil may react with water to produce ammonia or hydrogen chloride.

*The properties of this material have not been fully investigated. Use due caution in handling and use of this material.*

Corrosive--Cause burns to all body tissues. Irreversible damage possible. Harmful if swallowed or inhaled. **HMDS and Pyridine readily absorb through skin.** Vapors may cause dizziness and drowsiness.

*Emits toxic fumes under fire conditions*—carbon oxides, silicon oxides, nitrogen oxides, formaldehyde, ammonia, cyanide, chlorinated compounds

*Standard chemical handling precautions:* Avoid ingestion or breathing mists/vapors. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

*Target organs:* liver, kidneys, nerves and central nervous system (CNS), bone marrow

See Sections 4, 5, 6, 8, 9, and 10.

*Other Hazard Information*

Primary Route(s) of Entry: Skin or eye contact, vapor inhalation, ingestion

**Corrosive hydrochloric acid** (strong acid) may be formed on contact with the water in the skin, eyes, and mucous membranes; Hydrochloric acid is destructive to skin, eye, and mucous membrane tissues.

Eye: Corrosive--can cause burns or severe irritation, pain, itching, tearing, redness, corneal

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Skin: inflammation, blurred vision, lens damage. Photophobia and irreversible damage is possible. Corrosive--can cause burns upon short periods of contact. May be harmful if absorbed through skin with systemic effects described under inhalation or ingestion. Chronic contact may result in dermatitis. HMDS and pyridine are **readily absorbed through skin**.

Inhalation: Corrosive--Can cause burns or severe irritation to nose, throat, mucous membranes, respiratory tract, and lungs. May be harmful or fatal if inhaled due spasm, inflammation and edema (fluid retention and swelling) of the larynx, bronchi or lungs. May cause dizziness or drowsiness. Prolonged or repeated inhalation may cause tooth decay. May cause effects similar to that of ingestion.

Ingestion: Corrosive--Can cause burns, severe irritation, and permanent damage to mouth, throat, and stomach. May cause GI disorders, liver or kidney damage, or central nervous system depression, with headache, nausea, vomiting, dizziness, unconsciousness, and coma. Prolonged exposure may result in dizziness and general weakness. Aspiration of liquid while vomiting may seriously injure lungs.

Acute: See above route.  
 Chronic: See above route.  
 Symptoms: See above route.  
*Pre-existing conditions that may be aggravated:* liver, kidneys, nerves /central nervous system, bone marrow, skin, eyes, respiratory

See Section 11 for additional toxicological data.

**SECTION 4 ..... FIRST AID MEASURES .....**

Eye contact: Immediately flush eyes with copious amounts of water or eyewash solution for at least 15 minutes; lift eyelids occasionally. If irritation persists, consult physician.

Skin contact: Immediately remove contaminated clothing and shoes, then wash skin with soap and copious amounts of water. If irritation persists, consult physician.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration and keep person warm and at rest. If breathing is difficult, give oxygen; consult physician.

Ingestion: Wash out mouth with water provided person is conscious; give large amounts of water or milk. Repeat if vomiting occurs. Ingested corrosive should be diluted approximately 100 times to render it harmless to tissues (Dreisbach & Robertson; Handbook of Poisoning; 12th Ed.); consult physician; DO NOT induce vomiting without first consulting physician. If vomiting occurs, keep head lower than hips to help prevent aspiration. Maintain airway and respiration. Treat symptomatically and supportively.

*Wash contaminated clothing before reuse. Discard contaminated footwear.*

Physician note: Symptomatic and supportive care. No specific antidote, however can be treated same as hydrochloric acid exposure. Treatment based on physician judgment in response to reactions of the patient.

**SECTION 5 ..... FIRE FIGHTING MEASURES .....**

Flash Point: 67°F; 19°C	Method: tcc	Autoignition:	Not available
OSHA Flammability Class: IB		Explosion Limits:	upper: 12.4 %
NFPA: See Section 3 <b>Emergency Overview</b> on pg. 1			lower: 1.8 %

*Extinguishing Media*  
 Water may be effective for cooling, but may not effect extinguishment.



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*Special or Standard Fire Fighting Procedures*

Standard precautions for fighting large fires involving chemicals: Wear self-contained breathing apparatus (SCBA) and protective clothing to prevent contact with skin and eyes.

Do not allow extinguishing media to enter container.

*Unusual Fire and Explosion Hazards*

Highly flammable corrosive liquid and vapor.

Vapors are heavier than air, may travel long distances along the ground to ignition sources and flash back.

Vapor-air mixtures are explosive above flash point, within above stated limits.

Containers may build pressure or rupture when heated. Container explosion may occur under fire conditions.

Water spray may be used to cool fire-exposed containers.

*Hazardous Combustion or Decomposition Products*

carbon oxides, silicon oxides, chlorine, hydrogen chloride, phosgene; *May decompose on contact with water.*

**SECTION 6 ..... ACCIDENTAL RELEASE MEASURES .....**

Eliminate all ignition sources. Use spark proof tools.

Evacuate unnecessary people from area. Isolate spilled material.

Ventilate area.

Wear protective clothing to prevent contact with skin and eyes (lab coat, gloves, safety glasses).

Wear NIOSH/MSHA approved respirator for organic/acid gas, dust, and mists to prevent inhalation.

A fire guard should be posted during any clean up operation.

Contain and recover material when possible.

Neutralize with sodium bicarbonate or other suitable neutralizing agent.

Use chemically compatible spill pillows, or similar adsorbent material. This will help blanket corrosive, flammable vapors.

Collect, seal in appropriate hazardous waste container, and hold for proper waste disposal.

Wash spill site after material pickup is complete.

Do not allow material to enter drains or water courses.

**SECTION 7 ..... HANDLING AND STORAGE.....**

*General Handling Measures*

See Section 8 Below.

*General Storage Measures*

Store tightly closed in a cool, dry place with adequate ventilation, in a storage area suitable for flammable and corrosive liquids.

*Special Storage Instructions*

Empty containers retain product residue, (liquid/vapor), and can be dangerous.

Store in tinted glass bottle under nitrogen. Protect from moisture.

*Special Handling Instructions*

Handle and store under nitrogen. Protect from moisture.

Use appropriate precautions for highly flammable and corrosive liquids.

**Exposure levels of 3600 ppm is immediately dangerous to life and health--Adequately ventilate.**

Immediately remove contaminated clothing, as material is **readily adsorbed through skin.**



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**SECTION 8** ..... **EXPOSURE CONTROLS, PERSONAL PROTECTION** .....

*Airborne Exposure Limits*

		TWA (8H)		STEL		Ceiling Limit		Ceiling (skin)	
		ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
Pyridine 110-86-1	OSHA PEL	5	15	NE	NE	NE	NE	NE	NE
	ACGIH - TLV	5	16	NE	NE	NE	NE	NE	NE
Hexamethyldisilazane 999-97-3	OSHA PEL	NE	NE	NE	NE	NE	NE	NE	NE
	ACGIH - TLV	NE	NE	NE	NE	NE	NE	NE	NE
	<i>Dow Corning guide</i>	25	17	35	24	NE	NE	NE	NE
Trimethylchlorosilane 75-77-4	OSHA PEL	NE	NE	NE	NE	NE	NE	NE	NE
	ACGIH - TLV	NE	NE	NE	NE	NE	NE	NE	NE
	<i>Dow Corning Guide</i>	NE	NE	NE	NE	5	7	NE	NE

NE = Not established;

*Special/Other Control Measures*

Odor threshold: 10.0 ppm (TMCS); 46.8 ppm (HMDS)

*Personal Protective Equipment (PPE)*

Chemical safety eyewear.

Compatible chemical-resistant gloves: Rubber (e.g., natural rubber, neoprene, nitrile, or equivalent), Silver Shield®, Viton®, or 4H®

NIOSH/MSHA approved respirator for organic/acid gas, dust, and mists.

Impervious Protective Clothing.

*Other Standard Safety Equipment and Engineering Preventive Measures*

Safety shower and eye wash

Mechanical exhaust required. Hood recommended. Use adequate general and/or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Fume scrubber.

*General Precautions and Handling Measures*

Avoid ingestion, inhalation and contact with eyes, skin, and clothing.

Avoid prolonged or repeated exposure. Wash thoroughly after handling

Wash contaminated clothing before reuse. Discard contaminated footwear.

Immediately remove contaminated clothing, as material is **very corrosive to body tissues**.

**SECTION 9** ..... **PHYSICAL AND CHEMICAL PROPERTIES** .....

*Chemical Family:* halogenated acetamide; silyl in organic solvent      *Use:* Analytical: GC Derivatization; silylation reagent

*Appearance, Odor, and Other Properties*

*Appearance:* clear to cloudy liquid

*Odor:* strong, pungent odor

*MP:* -42°C (-44°F) (Pyridine)

*Reactivity:* reacts

*bp (1atm):* 115.3°C (239°F) (Pyridine)

*Solubility in Water:* decomposes

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FW:	161.39 (HMDS)	Specific Gravity (H <sub>2</sub> O = 1.0):	0.927
	108.64 (TMCS)	Refractive Index (n <sub>D</sub> <sup>20</sup> ):	NE
	79.10 (Pyridine)	pH:	NE
VP (mmHg):	16mm (20°C) (Pyridine)	Vapor Density (air=1):	2.73
% Volatiles:	77%	Evap. Rate (BuAc = 1.0):	>11
Soluble in Organic Solvents: NE			

**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**

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

RTECS #

CAS #

JM9230000	Hexamethyldisilazane	999-97-3
VV2710000	Trimethylchlorosilane	75-77-4
UR8400000	Pyridine	110-86-1

Only selected Registry of Toxic Effects of Chemical Substances data (RTECS) is presented here.  
 See actual entry in RTECS for complete information.

**Irritation Data**

	eye	skin
Hexamethyldisilazane	NDA	skn rbt 500 uL sev
Trimethylchlorosilane	eye rbt 5 uL mod	skn rbt 500 uL mod
Pyridine	eye rbt 2 mg open sev	skn rbt 10 mg/24H open mld; skn rbt 500 mg/24H mld

NDA = No data available

**Toxicity Data**

	oral	inhalation	dermal
Hexamethyldisilazane	orl rat LD50 1000mg/kg; orl rat LD50 850mg/kg	ihl LC50 870mg/m <sup>3</sup> /4H	skn rbt LD50 540mg/kg skn rbt LD50 710uL/kg

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**MATERIAL SAFETY DATA SHEET**

Toxicity Data	oral	inhalation	dermal
Trimethylchlorosilane	orl rat LD50 5660 uL/kg	ihl rat LC50 3000ppm/1H; ihl mus LCLo 500mg/m3/10M	skn rbt LD50 1780uL/kg
Pyridine	orl rat LD50 891 mg/kg	ihl rat LC50 28500 mg/m3/1H	skn rbt LD50 1121 mg/kg

Carcinogenicity	OSHA	IARC	NTP	ACGIH	NIOSH	Notes
Hexamethyldisilazane	NL	NL	NL	NL	NL	None
Trimethylchlorosilane	NL	NL	NL	NL	NL	Some studies have shown that TMCS may induce certain types of cancers
Pyridine	NL	NL	NL	NL	NL	None

NL = Not Listed as a carcinogen;

**Teratogenicity and Reproductive Effects**

No mammal studies were found on pyridine--tests in the hydra did not suggest the material should be tested in mammals.

**Neurotoxicity**

Hexamethyldisilazane and pyridine can adversely effect the nervous system..

**Mutagenicity**

Test on laboratory animals indicate TMCS may produce adverse mutagenic effects and cause tumors. Data in RTECS on hexamethyldisilazane indicate that it has been investigated as a tumorigen, but its status is questionable by RTECS criteria. RTECS files contain data on mutagen testing for pyridine.

**Miscellaneous**

Test on laboratory animals indicate TMCS may produce a decreased immune response.

**Acute and Chronic Effects**

Section 3 **Hazards Identification** above.

**SECTION 12 ..... ECOLOGICAL INFORMATION.....**

**Ecotoxicity, Environmental Fate and Transport:**

Hexamethyldisilazane and pyridine: No data available.

TMCS: Keep out of water supplies and sewers. Prevent any contamination of underground water. Hydrolyses to hexamethyldisiloxane.

*Water danger/protection:* WGH Salmonella typhimurium TA97, TA98, TA100, TA1353, TA1537 without metabolic activation positive.

*Aquatic toxicity:* Tlm96: 100-10 ppm.

**Standard Chemical Precautions**

Keep out of air, water, and soil

**SECTION 13 ..... DISPOSAL CONSIDERATIONS.....**

*That which cannot be recovered or recycled, should be disposed of in accordance with all applicable Federal, State, and local environmental regulations.*

RCRA waste code(s): D001, D002, D003 RCRA Hazard Class (40CFR 261): Ignitable, Corrosive, Reactive

**SECTION 14 ..... TRANSPORT INFORMATION.....**

*Ship in accordance with all applicable local, State, Federal, and International transportation regulations.*

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The following is a summary only. Check regulations for complete information:

U. S. Department of Transportation (49CFR171.101)  
 Shipping Name: Flammable Liquids, Corrosive, n.o.s., (Hydrox-Sil)  
 ID Number: UN2924  
 Hazard Class or Division: 3, Subsidiary Class: 8  
 Packing Group: PG II  
 Labeling: Flammable Liquid, Corrosive

**SECTION 15 REGULATORY INFORMATION**

Reviews, Standards, and Regulations

	Hydrox-Sil*	HMDS	TMCS	Pyridine
	NL	999-97-3	75-77-4	110-86-1
TSCA:	Y	Y	Y	Y
*This compound is sold strictly for research and development use.				
EINECS:	Y	Y	Y	Y
Number	NL	213-668-5	200-900-5	203-809-9
CERCLA [Section 103 (40 CFR 302.4)]:	NL	NL	NL	NL
RQ (lbs)	NA	NA	NA	1,000
RCRA Waste Code	NL	NL	NL	U196 (pure only)
OSHA Process Safety [29 CFR 1910.119]:	NL	NL	NL	NL
TQ (lbs)	NA	NA	NA	NA
Clean Air Act				
[Section 112r (40 CFR 68)]:	NL	NL	Y	NL
TQ (lbs)	NA	NA	10,000	NA
Contains Ozone Depleters (Class I or Class II)	N	N	N	N
[Section 103 (40 CFR 302.4)]:	NL	NL	NL	NL
State Lists:	NL	NL	NL	NL
States	NL	NL	FL,NJ, CA,FL,PN	PN,MA, MN,MA
On CA 65 Significant Risk Level	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
TPQ (lbs)	NA	NA	1,000	NA
RQ (lbs)	NA	NA	1,000	NA
Section 313 Ingredient [40 CFR 372.65]	NL	NL	Y	NL

**Hazard Classes**

Sara	Acute	Chronic	Fire	Pressure	Reactivity
Title III	Y	Y	Y	N	Y
	Health	Flammability	Reactivity	Special Hazards	
NFPA	3	3	2	W	
HMIS	3	3	2	None	

**Risk Phrases:**

**Caution: The properties of this material have not been fully investigated.**  
 Corrosive.

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- R11..... Highly Flammable
- R14..... Reacts with water
- R34..... Causes burns
- R48/23/24/25..... Harmful: danger of very serious irreversible effects through inhalation, in contact with skin, and if swallowed.
- R36/37/38..... Irritating to eyes (severely), respiratory system, and skin
- R40..... Possible risk of irreversible effects
- R67..... Vapors may cause drowsiness and dizziness

**Safety Phrases:**

- R36/37/38..... Irritating to eyes (severely), respiratory system, and skin
- S6/7/8/9..... Keep under nitrogen in a dry, tightly closed container, in a well ventilated place.
- S16..... Keep away from sources of ignition--no smoking.
- S23/24/25..... Do not breathe vapors. Avoid contact with skin and eyes.
- S26..... In case of contact with eyes, rinse immediately with plenty of water; seek medical advice.
- S30..... Never add water to this product.
- S 33..... Take precautionary measures against static discharges.
- S36/37/39..... Wear suitable protective clothing, gloves, and eye/face protection
- S44..... If you feel unwell, seek medical advice immediately (show the label where possible.)

**SECTION 16 ..... OTHER INFORMATION .....**

*Miscellaneous*

The health and toxicological hazards of this compound have not been fully investigated; therefore, this substance must be handled only by, or under close supervision of those qualified in the handling and use of potentially hazardous substances.

*This MSDS was revised as follows:*

<i>Section</i>	<i>Changes</i>
3.	Updated emergency section and health hazard information
3, 11	Moved carcinogen data to Sec. 11, eliminated some duplication.
4	Updated the ingestion first aid information.
6	Included contain and recover material and use of applicable spill pillows.
7	Eliminated some duplication.
8	Entered exposure limits.
9	Updated data based on TMCS to pyridine since there is a larger percentage.
11	Updated format of this section.
12	Updated information in this section.
15	Updated Risk and Safety Phrases

*Disclaimer*

The above information is believed to be correct, but does not purport to be all-inclusive and shall be used only as a guide. Regis Technologies, Inc., does not guarantee said information is accurate or complete, *nor shall any of this information constitute a warranty, whether expressed or implied, as to the safety of the goods, the merchantability of the goods, or the fitness of the goods for a particular purpose.* Adjustment may be required to conform to the actual conditions of usage. Regis Technologies, Inc. shall not be held liable for any damage resulting from handling or from contact with the above product, nor for the results obtained, or for incidental or consequential damage arising from the use of these data. No freedom from infringement of any patent, copyright or trademark is to be inferred.

Approved of by: MBF

***This is the last page of this MSDS.***

*Reviewed and re-approved of with minor changes to the abbreviations in the footer and format.*

by: M. Jon Pilli

07/21/2008

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