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: *TMCS or Trimethylchlorosilane*
Code: *1-270060-500, 1-270601-200, 1-270602-200, 1-270603-200*

SAFETY DATA SHEET

SECTION 1 ..... IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

1.1 Product Identifier
- Name: TMCS or Trimethylchlorosilane
- Code: 1-270060-500, 1-270601-200, 1-270602-200, 1-270603-200

1.2 Use of Substance/Mixture
- Use: Analytical Reagent—Gas Chromatography

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			
	Flammable Liquid	Category 2	H225
	EUH014 - Reacts violently with water		
Health Hazards			
	Acute Oral Toxicity	Category 3	H301
	Acute Dermal Toxicity	Category 4	H312
	Acute Inhalation Toxicity (Vapour)	Category 3	H331
	Skin Corrosion / Irritation	Category 1A	H314
	Serious Eye Damage / Irritation	Category 1	H314

Environmental Hazards - Not classified

GHS Label Elements

Pictograms or hazard symbols

Signal Word: Danger

Hazard Statements
- H225 – Highly flammable liquid and vapor
- H261 – In contact with water releases flammable gases.
- H301 – Toxic if swallowed.
- H312 – Harmful in contact with skin.
- H314 – Causes severe skin burns and eye damage.
- H331 – Toxic if inhaled.

Precautionary Statements
[Prevention] P210 – Keep away from heat and ignition sources.

P260 – Do not breathe vapors.
P264 – Wash thoroughly after handling.
P280 – Wear protective gloves/protective clothing/eye protection/face protection.
Note – Contact with metal may produce corrosive hydrochloric acid.

[Response] P304+P340-IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
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.
P337+P313 – If eye irritation persists: Get medical advice/attention.
P301+P330+P331-IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

[Storage] P403+P235-Store in a well-ventilated place. Keep cool.
P402+P404- Store in a dry place. Store in a closed container.

[Disposal] P501-Dispose of contents/container in accordance with all applicable governmental and environmental regulations.

SECTION 3 ..... COMPOSITION / INFORMATION ON INGREDIENTS

Name TMCS or Trimethylchlorosilane

Synonyms Chlorotrimethylsilane; Silane, trichloromethyl; Silane, chlorotrimethyl; TMSC

Hazardous components

Component	Classification	Concentration
Chlorotrimethylsilane CAS No. 75-77-4 EC No. 200-900-5	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 4; Acute Tox. 3; Skin Corr. 1A; Eye Dam. 1; H225, H261, H301 + H331, H312, H314	NLT 97%

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 will 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.

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, itching, tearing, redness, blurred vision, lens damage, blistering, difficult breathing, shortness of breath, burning sensation, cough, sore throat, abdominal pain, collapse, photophobia

4.3 Indication of immediate medical attention and special treatment needed.
Symptomatic and supportive care. Treatment same as for hydrochloric acid exposure.

SECTION 5 ..... FIRE-FIGHTING MEASURES

5.1 Suitable Extinguishing Media

Medium expansion (>30 :1) AFFF alcohol compatible foam, carbon dioxide, dry chemical powder, dry sand. ***NO hydrous agents. NO water.*** Water may be effective for cooling, but may not effect extinguishment for large fires.

5.2 Specific hazards arising from the chemical.

Highly flammable and corrosive liquid and vapor--hydrolyzes vigorously with water to produce corrosive hydrogen chloride gas, *that in contact with metal can produce flammable/explosive hydrogen gas.*
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.
Static electricity will accumulate and may ignite vapors. Use bonding and grounding or inert gas blanketing.
Containers may build pressure or rupture when heated. Container explosion may occur under fire conditions.

Hazardous Combustion or Decomposition Products
carbon oxides, silicon oxides, chlorine, hydrogen chloride, phosgene; Decomposes on contact with water.

5.3.1 Advice for fire-fighters

Do not allow extinguishing media to enter container.
Do not put water directly on the fire due to violent reaction. Water may be used to knock down corrosive vapor cloud down wind of fire and to keep fire exposed containers cool.
Apply medium expansion (>30 :1) AFFF alcohol compatible foam. Application of foam may initially produce significant evolution of corrosive hydrochloric acid vapors. The vapors will be reduced when uniform blanketing is achieved.
Difficult to extinguish--re-ignition may occur. A fire guard should be posted during any clean up operation.

5.3.2 Advice for fire-fighters – Protective gear

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

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 for corrosive and flammable conditions to prevent contact with skin and eyes. Avoid breathing mists. See Section 8.3.

6.2 Environmental precautions

Prevent material from entering drains.

6.3 Methods of clean up

Eliminate all ignition sources. Use spark proof tools.
Ventilate area. Isolate spilled material.
Wear NIOSH/MSHA approved respirator for organic/acid/amine gas, dust, and mists to prevent inhalation.
Contain and recover material when possible. Neutralize with sodium bicarbonate or other suitable neutralizing agent.
Absorb using chemically compatible spill pillows, or similar adsorbent material.
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.

SECTION 7 ..... HANDLING AND STORAGE

7.1 Safe Handling Precautions

Wear suitable protective equipment for flammables and corrosives to avoid contact with or inhalation of liquids or vapors.
Severely irritating to corrosive to all body tissues on contact.
Wash after handling.
Immediately remove contaminated clothing. Wash contaminated clothing prior to reuse. Dispose of contaminated footware.
Handle and store under nitrogen. Protect from moisture.
TMCS reacts violently with water or moist air to generate highly toxic and corrosive hydrogen chloride gas, which in contact with metal may produce flammable or explosive hydrogen gas.
Use appropriate precautions for highly flammable liquids with a high potential for static accumulation. Ground and bond containers or use inert gas purge when transferring or handling material. Use spark proof tools and explosion proof equipment.
Equipment (i.e., pumps, hoses, etc.) used in any handling of this material must be clean, dry and free of any oxygenated materials.
Static electricity will accumulate and may ignite vapors. Open containers cautiously. A high static potential will be generated during the transfer of this material.
Do not use foam or plastic materials when handling this chemical as plastic may enhance the static potential due to their non-conductive nature.
Do not repackage.

7.2 Storage Conditions

Store tightly closed under nitrogen, in a cool, place with adequate ventilation, in a storage area suitable for flammable and corrosive liquids.
Protect from light and heat.
Store away from incompatible materials (See Section 10.).

SECTION 8 ..... EXPOSURE CONTROLS / PERSONAL PROTECTION.....

8.1 Control parameters

Exposure limits	TMCS or Trimethylchlorosilane (75-77-4) – OSHA – PEL or ACGIH – TLV: No limits established. Dow Corning Guide – Ceiling Limit 5 ppm (7 mg/m^3) 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

Safety shower and eye wash.
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.

8.3 Personal protection

Eye/Face	Chemical safety eyewear or goggles.
Hand	Compatible chemical-resistant gloves for acidic corrosives such as hydrochloric acid.
Respiratory	If exposure likely: NIOSH/MSHA approved respirator for organic/acid gas, dust, 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. Wash thoroughly after handling.

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

9.1 Information on physical and chemical data

Chemical Formula	C_3H_9ClSii
Molecular Weight	108.64
Form	Liquid
Appearance	Clear colorless liquid

Odor	Hydrochloric acid odor	
Odor threshold	0.255 to 10.06 ppm (hydrochloric acid)	
pH	<7 (acidic in solution)	
Melting/freezing point	-58°C (-72°F)	
Boiling point:	57.9°C (135°F)	
Flammability (liquid)		
Flash Point	0.14°F (-18°C)	Method: tcc
Flammable limits (%,v/v)	UEL (upper explosive limit)	6.4 %
	LEL (lower explosive limit)	2.0 %
Autoignition temperature	395°C (743°F)	
Decomposition temperature	Not available	
OSHA Flammability Class	IB	
Evaporation Rate (BuAc = 1.0)	>1.0	
Vapor pressure (mmHg)	187 mmHg @ 20°C ; 26.7 kPa @ 20°C	
Vapor density (air=1):	3.8	
Relative density (g/cm^3)	0.860	
Water Solubility	rigorous decomposition - Insoluble. See water reactivity.	
Water reactive	Yes -- Readily hydrolyzes to hydrochloric acid	
Solubility (other)	toluene, ether, benzene, perchloroethylene	
Partition coefficient: N-octanol/water	Kow (Pow) = Not available	
Viscosity	0.37 cSt	
Refractive Index (n_D^{20})	1.3870	
Critical Temp:	224.6°C	
Critical Pressure:	31.6 atm	

SECTION 10 ..... STABILITY AND REACTIVITY

10.1 Reactivity
Stable if stored under nitrogen and protected from moisture.

10.2 Chemical Stability
Stable if stored under nitrogen and protected from moisture, heat and light.

10.3 Possibility of hazardous reactions
Oxidizers. Fire/explosion hazard.
Acids, bases, oxygenated materials--contact with these can generate HCl gas (see water below.)
Amines, alkalies, compounds with active or liable hydrogen
Alcohols, acetone--Violent reaction.
Metals
Water, moisture, or humid air--Violent reaction, hydrolyzing to corrosive hydrochloric acid, that in contact with metals may produce flammable and/or corrosive hydrogen gas.

10.4 Conditions to avoid
Avoid incompatibilities (See *Possibility of hazardous reactions* Section above.)
Protect from static, heat, flames, sparks, and ignition sources.
Keep out of water supplies and sewers.

10.5 Incompatible materials
(See *Possibility of hazardous reactions* Section above.).

10.6 Hazardous decomposition products
Combustion: carbon oxides, silicon oxides, chlorine, hydrogen chloride, phosgene
Decomposes (hydrolyzes) violently on contact with water or moist air to produce hydrochloric gas (CAS 7647-01-0), that in contact with metal can produce flammable/explosive hydrogen gas. Other hydrolysis products: Trimethylsilanol (CAS 1066-40-6) later condenses to form hexamethyldisiloxane (CAS 107-46-0) and water (CAS 7732-18-5).

SECTION 11 ..... TOXICOLOGICAL INFORMATION.....

11.1 Toxicological Information

Acute toxicity	
Oral LD50	orl rat LD50:5660 uL/kg (RTECS; Somnolence (general depressed activity), Dyspnea (shortness of breath), Gastrointestinal - other changes.)
	orl rat LD50 100-300 mg/kg (IUCLID; No data available).
Inhalation LC50	ihl rat LC50: 12.9 mg/L/1 hr (IUCLID; No data available).
Dermal LD50	skn rbt LD50:1780 uL/kg (RTECS; Altered sleep time (including change in righting reflex), Hypermobility, diarrhea, Weight change.)
Other acute toxicity	See actual entry in RTECS, IUCLID, or ECHA REACH entry for complete information.
Skin corrosion/irritation	Irritation skin: Rabbit: EC Classification: corrosive (causes burns); (ECHA REACH)
Skin Corrosion	Corrosive to skin: Rabbit (IUCLID and ECHA REACH; Several studies: severe burns, blisters, etc.)
Skin Irritation	skn rbt 500 uL mod (RTECS.)
Serious eye damage/irritation	Irritation eye: Rabbit: EC Classification: causes eye damage; (ECHA REACH)
Serious Eye Damage	Damage to eyes: Rabbit (IUCLID and ECHA REACH; Several studies: severe burns, blisters, etc.)
Eye Irritation	eye rbt 5 uL mod (RTECS)
Respiratory irritation	No data available
Respiratory or skin sensitization	No data available
Germ cell Mutagenicity	
Genotoxicity in Vitro	mmo-sat 1 mg/plate (+S9); Ames test negative (RTECS)
Carcinogenicity	
IARC	No data available.
NTP	No data available
OSHA	No data available
Other	ipr mus TDLo 1 g/kg/I, Lung tumors; Neoplastic tumorigenic agent by RTECS criteria.
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	VV2710000

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

See NLM-HSDB for a detailed discussion about environmental fate in air, soil, and water.

12.1 Ecotoxicity

Toxicity to Fish	No data available.
Toxicity to Crustacea	No data available.
Toxicity to Aq. Plants	No data available.
Toxicity to Bacteria	*Water danger/protection*: WGH Salmonella typhimurium TA97, TA98, TA100, TA1353, TA1537 without metabolic activation positive.
	Aquatic toxicity: Tlm96: 100-10 ppm.

12.2	Persistence and degradability	Readily degrades by hydrolysis and photochemically produced hydroxyl radicals. Biodegradability – Material rapidly hydrolyzes immediately on contact with water to produce hydrochloric acid, which could potentially the pH of the water environment and pose a short term local hazard.
12.3	Bioaccumulative potential	BCF = no data available and Log Kow = no data available; TMCS immediately hydrolyzes on contact with water, therefore it is not likely to bioaccumulate.
12.4	Motility in soil	Decomposition is expected to occur more rapidly than absorption or volatilization.
12.5	Other adverse effects	No data available for this product. Do not discharge into the environment.

SECTION 13 ..... DISPOSAL CONSIDERATIONS

13.1 Disposal methods

U . S. EPA Waste Codes	D001, D002, D003
Waste Characterization (per U. S. regulations)	RCRA Hazard Class (40CFR 261): Ignitable, Corrosive, Reactive. 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

DOT (US)

UN number 1298	Class 3 (8)	Packing Group	II
Proper shipping name	Trimethylchlorosilane		
Marine pollutant	no		
Poison Inhalation hazard	no		

IATA number 1298 Class 3 (8) Packing Group II

UN proper shipping name	Trimethylchlorosilane
Note	IATA (Passenger) is forbidden. Maximum quantity on IATA (Cargo) is 5 liters.

IMDG/IMO

UN number 1298	Class 3 (8)	Packing Group	II
UN proper shipping name	TRIMETHYLCHLOROSILANE		
Marine pollutant	no		
Special precautions for user	EMS-No: F-E, S-C		

ADR/RID

UN number 1298	Class 3 (8)	Packing Group	II
UN proper shipping name	TRIMETHYLCHLORO-SILANE		
Transport Hazard Class	3 (8)		
Packing group	PG II		

SECTION 15 ..... REGULATORY INFORMATION

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

NFPA: H3 F3 R2 ~~W~~ (avoid water) HMIS: H3 F3 R2

15.2 Chemical Inventory Lists

..... TMCS or Trimethylchlorosilane or chlortrimethylsilane
CAS Number..... 75-77-4
TSCA: ..... Y
EINECS:..... Y

Some abbreviations used throughout this MSDS: NA=not applicable; NE=not established; U=unknown/unavailable; NL=not listed; N=no; Y=yes.

Number 200-900-5

15.2 Chemical Inventory Lists (contineued)

..... TMCS or Trimethylchlorosilane or chlortrimethylsilane

CERCLA [Section 103 (40 CFR 302.4)]: ..... NL
RQ (lbs) ..... NA
RCRA Waste Code ..... NL
OSHA Process Safety [29 CFR 1910.119]: ..... NL
TQ (lbs) ..... NA
Clean Air Act
[Section 112r (40 CFR 68)]: ..... Y
TQ (lbs) 10,000
RQ (lbs) ..... NA
Contains Ozone Depleters (Class I or Class II) ..... N
[Section 103 (40 CFR 302.4)]: ..... NL
SARA Title III Notification [40 CFR 302.4]:
Section 302/304 (EHS) Ingredient [40 CFR 355.3] ..... Y
TPQ (lbs) 1,000
RQ (lbs) 1,000
Section 313 Ingredient [40 CFR 372.65] ..... Y
SARA Hazards Acute.....Y Chronic..... N Fire .....Y Pressure..... N Reactivity .....Y
State Lists: ..... Y
States ..... NJ,FL,PN,MA
On CA 65 Significant Risk Level ..... NL

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

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

Flam. Liq.	Flammable liquids
Acute Tox.	Acute toxicity
Skin Corr.	Skin corrosion.
Eye Dam.	Serious eye damage
H225	Highly flammable liquid and vapour.
H261	In contact with water releases flammable gases.
H301+ H331	Toxic if swallowed or if inhaled
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.

16.2 Literature References

Centre Européen des Silicones – *Safe Handling of Chlorosilanes (23 Aug. 2003).*
Dow Corning GPS [Global Product Strategy] Safety Reports for Chlorotrimethylsilane .
ECHA REACH Registered Substance, last updated 8 Nov. 2013 – EC/List No. 200-900-5 , Chlorotrimethylsilane, Full registration type, Joint submission, tonnage band – 10,000 – 1000,000 tones per annum.
IUCLID Dataset Chlorotrimethylsilane, 19 Feb. 2000.
New Jersey Haz. Sub. Fact Sheet for Hydrochloric Acid - Aug 2009.
NLM-HSDB: U. S. National Library of Medicine; Hazardous Substance Database (Toxnet®) Number: 1009; Chlorotrimethylsilane; CAS 75-77-4; Last Revision Date: 20070604.
RTECS: RN VV2710000; Chlorotrimethylsilane; Updated Oct 1997.

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.