



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: Bis(trimethylsilyl)trifluoroacetamide + 10% Trimethylchlorosilane
 Code: 1-270003-500, 1-270130-200, 1-270131-200, 1-270132-200, 1-270133-200, 1-270134-200, 1-270135-200

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

SECTION 1 PRODUCT IDENTIFICATION

Name: Bis(trimethylsilyl)trifluoroacetamide + 10% Trimethylchlorosilane

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

Synonyms

N,O-Bis(trimethylsilyl)trifluoroacetamide + 10% Trimethylchlorosilane; Regisil® + 10% TMCS; RC-3;
 BSTFA + 10% TMCS; 2,2,2-Trifluoro-*N,O*-bis(trimethylsilyl)acetamide + 10% TMCS

CAS #: 25561-30-2
 CAS #: 75-77-4

MF : C₈H₁₈F₃NOSi₂ BSTFA
 MF : (CH₃)₂SiCl TMCS

Ingredients

	<i>Concentration (%/wt)</i>
BSTFA (25561-30-2)	84-94.0 %
TMCS (75-77-4)	5-15.0 %
Manufacturing Impurities	<1.0 %

SECTION 3 HAZARDS IDENTIFICATION.....

Precautionary Statements

See Sections 8 and 11 for further details.

Flammable Liquid, Corrosive

..... **Emergency Overview**

NFPA Ratings (Scale 0-4); Health = 3; Fire = 3; Reactivity = 1W;

Liquid: Clear, colorless with a strong, pungent odor
 Flammable and corrosive liquid and vapor. May cause flash fire. Avoid ignition sources.
 Vapor may be severely irritating or cause burns to eyes, mucous membranes, and upper respiratory tract. Harmful if swallowed or inhaled.
 Reacts with water. Hydrolyzes readily in contact with water or moist air. TMCS can readily react with water or moist air to form corrosive hydrogen chloride.
The properties of this material have not been fully investigated. Use due caution in handling and use of this material.
May emit toxic fumes under fire conditions—potential chemical or thermal decomposition products: carbon monoxide, carbon dioxide, silicon oxides, nitrogen oxides, hydrogen fluoride, hydrogen chloride
Standard chemical handling precautions: Avoid ingestion or breathing vapors or mists. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.
Target organs: eyes, skin, mucous membranes, respiratory system.

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

Other Hazard Information

This compound has not fully been tested for toxicological, irritation, or similar tendencies.

Primary Route(s) of Entry: Eye or Skin contact, Inhalation

Eye: Corrosive. Can cause severe irritation, dryness, and burns.

Skin: Corrosive. Can cause irritation, dryness, and minor burns. Prolonged or repeated skin contact may cause dermatitis.

Inhalation: Corrosive. Can cause severe irritation or burns to mucous membranes and upper respiratory system. May be harmful or fatal if inhaled in large quantities due to spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema.

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Ingestion: Corrosive. May cause irritation or burns to mucous membranes.
 Acute: See above route.
 Chronic: See above route.
Target Organs: eyes, skin, mucous membranes, respiratory system.
 Symptoms: Results of overexposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting and/or dizziness and/or suffocation.
Pre-existing conditions that may be aggravated: respiratory conditions.

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.
 Physician note: Symptomatic and supportive care. There is no specific antidote. Treatment based on physician judgment in response to reactions of the patient.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point: < 68°F Method: tcc Autoignition: NE
 OSHA Flammability Class: IB Flammable Limits: upper: NE
 NFPA: See Section 3 **Hazards Identification Emergency Overview** above. lower: NE

Extinguishing Media

Water spray, carbon dioxide, dry chemical powder, or appropriate foam (medium expansion (>30 :1) AFFF alcohol compatible foam).

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.

Standard Fire and Explosion Hazards

Avoid inhalation of material or combustion by-products.

Unusual Fire and Explosion Hazards

Flammable and corrosive liquid and vapors. TMCS may react vigorously with water or moist air to form corrosive hydrogen chloride. The vapors will be reduced when uniform blanketing is achieved.

Note: Chlorosilanes, such as TMCS, may accumulate static and spontaneously re-ignite after a fire has been extinguished.

Vapors are heavier than air and may travel a considerable distance to ignition sources and flash back.

Vapor-air mixtures, in large quantities, are explosive above flash point.

Container explosion may occur under fire conditions.

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

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MATERIAL SAFETY DATA SHEET

Hazardous Combustion or Decomposition Products

May emit carbon monoxide, carbon dioxide, silicon oxides, nitrogen oxides, hydrogen fluoride, hydrogen chloride

SECTION 6 ACCIDENTAL RELEASE MEASURES

Eliminate all ignition sources/slight fire hazard in small quantities.
 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 and acidic vapor to prevent inhalation irritation.
 If neat, or in solution, use chemically compatible spill pillows, or similar adsorbent material.
 Sweep up, seal in appropriate hazardous waste container, and hold for proper waste disposal.
 Avoid inhalation of vapors.
 Wash spill site after material pickup is complete.
 Standard chemical precautions: Keep out of water supplies and sewers.
 TMCS (75-77-4): 1 pound RQ; SARA Section 304.

SECTION 7 HANDLING AND STORAGE

General Handling Measures

See Section 8 Below.

General Storage Measures

Store in closed vessel in area suitable for flammable liquids, away from ignition and heat sources.
 Store in a cool, dry place with adequate ventilation.

Special Storage Instructions

Store in tinted glass bottle under nitrogen.

Special Handling Instructions

Protect from moisture.
 Avoid: Strong acids, strong oxidizers, alcohols, air, and water.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

Airborne Exposure Limits

		TWA		STEL		Ceiling		skin
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
BSTFA 25561-30-2	OSHA - PEL	NE	NE	NE	NE	NE	NE	NE
	ACGIH - TLV	NE	NE	NE	NE	NE	NE	NE
TMCS 75-77-4	OSHA - PEL	NE	NE	NE	NE	NE	NE	NE
	ACGIH - TLV	NE	NE	NE	NE	NE	NE	NE

NE = Not established

Special/Other Control Measures

Odor threshold: NE

Personal Protective Equipment (PPE)

Chemical safety eyewear or goggles. Compatible chemical-resistant gloves. Protective Clothing (e.g., lab coat)
 Wear NIOSH/MSHA approved respirator for organic and acidic vapor to prevent inhalation irritation.

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Other Standard Safety Equipment and Engineering Preventive Measures

Safety shower and eye wash. Mechanical exhaust required. Hood recommended.

General Precautions and Handling Measures

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

Avoid prolonged or repeated exposure. Wash thoroughly after handling.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Chemical Family: BSTFA: halogenated acetamide; silyl
 TMCS: aliphatic halogen; silane

Use: Analytical water scavenger; Silylation Reagent for GC

Appearance, Odor, and Other Properties

Appearance: clear, colorless liquid

Odor: strong, pungent odor

MP: NE

Solubility in Water: not soluble

bp: 147°C (296°F)

Water Reactive: yes

FW: 257.40 (BSTFA) + 108.66 (TMCS)

VP (mmHg): <1 (20°C)

Evap. Rate: <1 (BuAc = 1.0):

Vapor Density (air=1): >1

pH: NE

Specific Gravity (H₂O = 1.0): 1.028

Solubility in Organic Solvents: NE

Refractive Index (n_D²⁰): 1.3840 (BSTFA)

SECTION 10 STABILITY AND REACTIVITY

Stability

Stable if stored under nitrogen and protected from moisture.

Incompatibilities

Strong Acids, Alcohols, Strong Oxidizers

May decompose upon exposure to air or water.

Precautions

Avoid incompatibilities. Protect from heat and ignition sources.

Keep out of water supplies and sewers.

Hazardous Combustion or Decomposition Products

May emit carbon monoxide, carbon dioxide, silicon oxides, nitrogen oxides, hydrogen fluoride, hydrogen chloride

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 #:

VV2710000	TMCS	75-77-4
NA	BSTFA	25561-30-2
NA	RC-2	NA

NA = Not Assigned

Only selected Registry of Toxic Effects of Chemical

Substances data (RTECS) is presented here.

See actual entry in RTECS for complete information.



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MATERIAL SAFETY DATA SHEET

Irritation Data

	eye rbt	skn rbt
TMCS 75-77-4	5 uL mod	500 uL mod
BSTFA 25561-30-2	NDA	NDA
RC-2	NDA	Corrositex® – Packing Group II

NDA = No data available; Corrositex® is a registered trademark of InVitro International.

Toxicity Data

	orl	lhl	skn
TMCS 75-77-4	orl rat LD50 5660uL/kg	ihl rat LC50 3000ppm/1H; ihl mus LCLo 500mg/m3/10M	skn rbt LD50 1780uL/kg
BSTFA 25561-30-2	NDA	NDA	NDA
RC-2	NDA	NDA	NDA

Carcinogenicity

	OSHA	IARC	NTP	ACGIH	NIOSH	Notes
TMCS	NL	NL	NL	NL	NL	Some studies have shown that TMCS may induce certain types of cancers
BSTFA	NL	NL	NL	NL	NL	None.
RC-2	NL	NL	NL	NL	NL	None.

NL = Not Listed as a carcinogen;

Teratogenicity and Reproductive Effects

No data available.

Mutagenicity

Tests on laboratory animals indicate TMCS may produce adverse mutagenic effects and cause tumors.

Miscellaneous

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

RC-2 primarily contains BSTFA with only a little TMCS. It is expected that its toxicity behavior will be predominantly similar to that of neat BSTFA. However, as a precaution the toxicity information for neat TMCS is as follows:

TMCS is very corrosive. Harmful by inhalation, ingestion, or skin absorption. May burn eyes, skin, and gastrointestinal system; Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Severe inhalation may be fatal due to spasm or inflammation of the larynx.

Target organs: lungs, nerves, respiratory system, immune system, neoplastic tumorigenic agent

Symptoms: Results of overexposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting and/or dizziness and/or suffocation. May aggravate pre-existing respiratory conditions.

Chronic Effects Prolonged or repeated skin contact may cause dermatitis and inhalation may cause tooth decay. See specific route above for other effects.

Acute Effects

See specific route responses in Section 3 **Hazards Identification** above.

Symptoms: See Section 3 **Hazards Identification** above.



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MATERIAL SAFETY DATA SHEET

Chronic Effects

See Section 3 **Hazards Identification** above.
 Target organs: eyes, skin, mucous membranes, respiratory tract

SECTION 12 ECOLOGICAL INFORMATION

TMCS 75-77-4

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

Aquatic toxicity: TIm96: 100-10 ppm.
 Environmental fate: Hydrolyses to hexamethyldisiloxane.

BSTFA 25561-30-2

No data available.

RC-3 No data available.

Standard Chemical Precautions

Keep out of water, air, 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 RCRA Hazard Class (40CFR 261): ignitable, corrosive

SECTION 14 TRANSPORT INFORMATION

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

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

U. S. Department of Transportation (49CFR171.101)

Shipping Name: Corrosive, flammable liquids, n.o.s., (trimethylchlorosilane, bis(trimethylsilyl)trifluoroacetamide)

ID Number: UN 2920

Hazard Class or Division: 8 (3)

Packing Group: PG II

Labels: Corrosive Liquid, Flammable

SECTION 15 REGULATORY INFORMATION

Reviews, Standards, and Regulations

	BSTFA	TMCS	RC-3
CAS Number	25561-30-2	75-77-4	NE
TSCA:	NL	Y	NL
RC-3 is sold strictly for research and development use, however, some components may be listed on TSCA Inventory.			
EINECS:	Y	Y	NL
Number	247-102-9	200-900-5	NL
CERCLA [Section 103 (40 CFR 302.4)]:	NL	NL	NL
RQ (lbs)	NA	NA	NA
RCRA Waste Code	D001, D002	D001, D002	D001, D002
OSHA Process Safety [29 CFR 1910.119]:	NL	NL	NL
TQ (lbs)	NA	NA	NA

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MATERIAL SAFETY DATA SHEET

Reviews, Standards, and Regulations (continued)

.....BSTFA..... TMCS..... RC-3
 CAS Number..... 25561-30-2 ... 75-77-4..... NE
 Clean Air Act
 [Section 112r (40 CFR 68)]:..... NL..... Y..... NL
 TQ (lbs)..... NA..... 10,000..... NA
 Contains Ozone Depleters (Class I or Class II)..... N..... N..... N
 [Section 103 (40 CFR 302.4)]:..... NL..... NL..... NL
 State Lists:..... NL..... Y..... NL
 States..... NL..... NJ,FL,PN,MA..... NL
 On CA 65 Significant Risk Level..... NL..... NL..... NL
 SARA Title III Notification [40 CFR 302.4]:
 Section 302/304 (EHS) Ingredient [40 CFR 355.3]..... NL..... Y..... NL
 TPQ (lbs)..... NA..... 1,000..... NA
 RQ (lbs)..... NA..... 1,000..... NA
 Section 313 Ingredient [40 CFR 372.65]..... NL..... Y..... NL

Hazard Classes

RC-2	Sara	Acute	Chronic	Fire	Pressure	Reactivity
	Title III	Y	N	Y	N	Y
		Health	Flammability	Reactivity	Special Hazards	
	NFPA	3	3	1	None	
	HMIS	3	3	1	None	
BSTFA 25561-30-2	Sara	Acute	Chronic	Fire	Pressure	Reactivity
	Title III	N	N	Y	N	N
		Health	Flammability	Reactivity	Special Hazards	
	NFPA	2	3	1	W	
	HMIS	2	3	1	None	
TMCS 75-77-4	Sara	Acute	Chronic	Fire	Pressure	Reactivity
	Title III	Y	N	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

R11..... Highly Flammable

R20/21/22..... Harmful by inhalation, in contact with skin and if swallowed

R34..... Causes burns.

R36/37/38..... Irritating to eyes (severely), respiratory system, and skin.

R40..... Possible risk of irreversible effects.

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R41 Risk of serious damage to eyes.

Safety Phrases:

- S7/8 Keep container tightly closed and dry.
- S9 Keep container in a well-ventilated place.
- S16 Keep away from ignition sources--no smoking.
- S23 Do not breathe vapors.
- S24/25 Avoid contact with skin and eyes.
- S26/28 In case of contact with eyes or skin, rinse immediately with plenty of water and seek medical advice.
- S33 Take precautionary measures against static discharges.
- S36/37/39 Wear suitable protective clothing, gloves, and eye/face protection.

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:

Updated to the current format to eliminate some unnecessary duplication of information.

Section Changes

- 1-16 Updated to new stock code number format, style, and minor editing corrections. In addition the following major change to this MSDS was made:
- 5 Brought the fire-fighting information more in line with laboratory conditions due to the limited quantities typically handled.
- 11 Updated RC-2 skin irritation testing data.
- 14 Corrected shipping information to corrosive, flammable.
- 15 Updated the R and S codes to include corrosive.

Note: While BSTFA hydrolyzes readily, it does not lose its fluorine atoms in contact with water. The fluorine atoms in BSTFA are not removed by hydrolysis and are quite stable except under extreme fire conditions. TMCS can readily lose the chlorine atom attached to the silane on contact with water and produce corrosive HCl. The solution of BSTFA and TMCS will be more reactive than pure BSTFA, but will not be violently reactive with water like a pure solution of TMCS. The solution is moderately corrosive (e.g., IATA packing group II) and due to the TMCS may have some static accumulation ability.

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.

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