



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: TFAA or Trifluoroacetic Anhydride
 Code: 1-270084-500, 1-270841-200, 1-270843-200

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

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

- 1.1 Product Identifier
 - Name TFAA or Trifluoroacetic Anhydride
 - Code 1-270084-500, 1-270841-200, 1-270843-200
- 1.2 Use of Substance/Mixture
 - Use Analytical Reagent for 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

Health Hazards

Acute toxicity (inhalation)	Category 4	H332
Skin Corrosion / Irritation	Category 1A	H314
Serious Eye Damage / Irritation	Category 1	H314

Environmental Hazards

Acute chronic toxicity	Category 3	H412
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GHS Label Elements

Pictograms or hazard symbols



Signal Word Danger

Hazard Statement

- H314 – Causes severe skin burns and eye damage.
- H332 – Harmful if inhaled.
- H412 – Harmful to aquatic life with long lasting effects.
- EUH014 – Reacts violently with water.

Precautionary Statements

- [Prevention] P280 – Wear protective gloves/eye protection/face protection.
- P232 – Protect from moisture.
- P273 – Avoid release to the environment.
- [Response] P301+P330+P331 – IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
- P303+P361+P353 – IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340 – IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

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SAFETY DATA SHEET

[Storage] P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P314 – Get medical advice/attention if you feel unwell.
 P402+P404 – Store in a dry place. Store in a closed container.
 P403+P235 – Store in a well-ventilated place. Keep cool.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Name TFAA or Trifluoroacetic Anhydride
 Synonyms 2,2,2-Trifluoroacetic anhydride

Hazardous components

Component	Classification	Concentration
Trifluoroacetic Anhydride CAS No. 407-25-0 EC No. 206-982-9	Acute Tox 4; Skin Corr. 1A; Eye Corr. 1; Chronic Aq.; EUH014; H314; H332; H412	≥ 99-100 %

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: Do not attempt to neutralize as it frequently makes matters worse.
 Eye contact: Rinse eyes with plenty of water 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 plenty of water. If irritation persists, consult physician.
 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.
 Ingestion: Give large amounts of water or milk (two glasses at most). Avoid vomiting. Consult physician immediately. Do not attempt to neutralize.
 Physician note: Symptomatic and supportive care. There is no specific antidote.

4.2 Most important symptoms and effects, both acute and delayed.
 Causes severe skin burns and eye damage. Risk of blindness.

4.3 Indication of immediate medical attention and special treatment needed.
 No data available.

SECTION 5 FIRE-FIGHTING MEASURES

5.1 Suitable Extinguishing Media
 Carbon dioxide, dry chemical powder, dry sand.

5.2 Specific hazards arising from the chemical.
 Violently reacts with water to produce the strong acid trifluoroacetic acid (TFA) (CAS No. 422-64-0).
 Water spray may be used to cool fire-exposed containers. Emits toxic fumes under fire conditions.
 Produces carbon oxides, hydrogen fluoride upon combustion.

5.3 Advice for fire-fighters
 Wear personal protective equipment for corrosive acidic vapor conditions. Wear self-contained breathing apparatus (SCBA) if necessary.



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SECTION 6 ACCIDENTAL RELEASE MEASURES.....

- 6.1 Personal precautions, protective equipment, and emergency procedures
 For non-emergency personnel - Do not breath vapors or mists. Avoid material contact. Evacuate unnecessary personnel from area, observe emergency procedures, consult an expert.

 For emergency responders – Protective equipment for corrosive acidic vapor conditions. See Section 8.3.
- 6.2 Environmental precautions
 Prevent material from entering drains. Risk of violent reaction and formation of trifluoroacetic acid.
- 6.3 Methods of clean up
 Evacuate unnecessary people from area. Isolate spilled material.
 Ventilate area. Eliminate all ignition sources. Use spark proof tools.
 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.
 Sweep up, 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 to avoid contact with skin, eyes, or inhalation of corrosive acidic vapors.
 Wash thoroughly after handling. Immediately remove contaminated clothing.
 Handle in a dry, well ventilated area. Use local exhaust if vapor can be generated.
 Keep away from ignition sources. Take precautionary measures against static discharge.
 Handle under nitrogen. Protect from moisture. Water/moist air contact produces trifluoroacetic acid.
- 7.2 Storage Conditions
 Store under inert gas in a tightly sealed container. Store in a cool, dry place suitable for flammable and corrosive materials.
 Protect from moisture, ignition sources, and away from alkaline, acidic and oxidizing materials.

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

- 8.1 Control parameters
 - Exposure limits Trifluoroacetic anhydride – No data available.
 - Environmental Do not empty into drains. Harmful for aquatic organisms due to acid pH.
- 8.2 Appropriate engineering controls
 - Safety shower and eye wash
 - Local exhaust and mechanical ventilation required. Hood recommended. Fume scrubber.
- 8.3 Personal protection
 - Eye/Face Chemical safety eyewear or goggles
 - Hand Compatible chemical-resistant gloves: Rubber (e.g., natural rubber, neoprene, nitrile, or equivalent), Silver Shield®, Viton®
 - Respiratory NIOSH/MSHA or European Standard EN 149 approved respirator for organic/acid gas, dust, and mists if exposure limits are exceeded or irritation or other symptoms are experienced.
 - Dermal (not hand) Protective Clothing (e.g., lab coat)--flame retardant anti-static material recommended.
 - Hygiene Avoid inhalation, ingestion; contact with eyes, skin, and clothing; and prolonged or repeated exposure. Wash thoroughly after handling. Wash contaminated clothing before reuse. Discard contaminated footwear.

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SECTION 9 **PHYSICAL AND CHEMICAL PROPERTIES**

9.1 Information on physical and chemical data

Chemical Formula	C ₄ F ₆ O ₃	
Molecular Weight	210.03	
Form	liquid	
Appearance	clear, colorless	
Odor	pungent, strong	
Odor threshold	No data available	
pH	< 1	
Melting/freezing point	-63.5 °C (-82.3 °F)	
Boiling point:	39.5-40°C (103°F)	
Flammability (liquid, solid)		
Flash Point	Not applicable	Method: Not applicable
Flammable limits (%v/v)	LEL (lower explosive limit)	Not applicable
UEL (upper explosive limit)	No data available	
Autoignition temperature	No data available	
Decomposition temperature	No data available	
OSHA Flammability Class	No data available	
Evaporation Rate (BuAc = 1.0)	No data available	
Vapor pressure (mmHg)	No data available	
Vapor density (air=1):	3.9 @ 20°C (68°F) (trifluoroacetic acid)	
Relative density (g/cm ³)	1.487	
Water Solubility	Decomposes/ hydrolyzes, hygroscopic	
Water reactive	Yes—violently hydrolyzes to form trifluoroacetic acid	
Solubility (other)	Soluble in halogenated solvents; insoluble in polar solvents.	
Partition coefficient: N-octanol/water	Log Pow = 0.79 (trifluoroacetic acid)	
Viscosity	No data available	

SECTION 10 **STABILITY AND REACTIVITY**

- 10.1 Reactivity
Reactive to water or moisture.
- 10.2 Chemical Stability
Stable if stored under nitrogen and protected from moisture and heat.
- 10.3 Possibility of hazardous reactions
Decomposes on contact with water or moist air to form corrosive trifluoroacetic acid.
- 10.4 Conditions to avoid
Avoid incompatibilities.
Protect from heat and ignition sources.
Keep out of water supplies and sewers.

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- 10.5 Incompatible materials
 - Alkalies or metals
 - Strong bases
 - Strong oxidizers or reducing agents
 - Moist air or water
- 10.6 Hazardous decomposition products
 - Combustion carbon oxides, hydrogen fluoride
 - Decomposition trifluoroacetic acid, a strong acid

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

11.1 Toxicological Information

Acute toxicity	
Oral	No data available.
Dermal	No data available.
Inhalation	Harmful if inhaled. (Trifluoroacetic acid: NOEC, ihl rat 300mg/m3, 4H, vapor)
Skin corrosion/irritation	Corrosive. Can cause severe skin burns.
Serious eye damage/irritation	Corrosive. Can cause eye burns, blindness, lacrimation, and destruction of mucous membranes. Based on skin corrosivity.
Respiratory irritation	No data available.
Respiratory or skin sensitization	No data available
Germ cell mutagenicity	No data available
Carcinogenicity	No data available
IARC	No data available
NTP	No data available
Reproductive toxicity	No data available
STOT-single exposure	No data available
STOT-repeated exposure	No data available
Aspiration hazard	No data available
RTECS Number	AJ9800000

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

12.1 Ecotoxicity	No data available.
Toxicity to Fish	No data available.
Toxicity to Crustacea	No data available.
Toxicity to Aq. Plants	No data available.
Toxicity to Bacteria	No data available.
12.2 Persistence and degradability	No data available.
12.3 Bioaccumulative potential	BCF = no data available and Log Kow = no data available.
12.4 Motility in soil	No data available.

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12.5 Results of PBT and vPvB assessment No data available.

12.5 Other adverse effects
 Additional ecological information No data available on TFAA. Contact with water produces trifluoroacetic acid (TFA). Harmful for aquatic organisms due to acid pH. Do not discharge into the environment.

SECTION 13 **DISPOSAL CONSIDERATIONS**

13.1 Disposal methods
 U . S. EPA Waste Codes D002
 Waste Characterization (per U. S. regulations) RCRA Hazard Class (40CFR 261): Corrosive
 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 3265
 14.2 UN proper shipping name Corrosive liquid, acidic, organic, n.o.s. (trifluoroacetic anhydride)
 14.3 Transport Hazard Class 8
 14.5 Packing group PG I
 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 F3 R2 ~~W~~ (avoid water) HMIS: H3 F3 R2

15.2 Chemical Inventory Lists

Reviews, Standards, and Regulations

..... Trifluoroacetic Anhydride
 CAS number 407-25-0
 TSCA: Y
 This compound is sold strictly for FDA or research and development use.
 EINECS: Y
 Number 206-982-9
 CERCLA [Section 103 (40 CFR 302.4)]: NL
 RQ (lbs) NA
 RCRA Waste Code NA
 Clean Air Act
 [Section 112r (40 CFR 68)]: NL
 TQ (lbs) NA
 Contains Ozone Depleters (Class I or Class II) N
 SARA Title III Notification [40 CFR 302.4]:
 Section 302/304 (EHS) Ingredient
 [40 CFR 355.3] NL
 TPQ (lbs) NA
 RQ (lbs) NA
 Section 313 Ingredient [40 CFR 372.65] NL
 SARA Hazards Acute.....Y Chronic..... N Fire.....N Pressure..... N Reactivity Y

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Reviews, Standards, and Regulations (continued)

..... Trifluoroacetic Anhydride
 CAS number 407-25-0
 OSHA Process Safety [29 CFR 1910.119]: NL
 TQ (lbs) NA
 State Lists: NL
 States NL
 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.

Acute Tox.	Acute toxicity
Chronic Aq.	Acute chronic toxicity
EUH014	Reacts violently with water.
Eye Dam.	Serious eye damage
H314	Causes severe skin burns and eye damage.
H332	Harmful if inhaled.
H412	Harmful to aquatic life with long lasting effects.
Skin Corr.	Skin corrosion

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.

Prepared by: Regis Technologies

This is the last page of this MSDS.