

Material Safety Data Sheet



Sulfur Tetrafluoride

Section 1. Chemical product and company identification

Product name	: Sulfur Tetrafluoride
Supplier	: AIRGAS INC., on behalf of its subsidiaries 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
Synonym	: Sulfur tetrafluoride; Sulfur fluoride (SF ₄), (T-4)-; Sulfur fluoride (SF ₄), (beta-4)-
Material uses	: Other non-specified industry: FLUORINATING AGENT FOR MAKING WATER AND OIL REPELLENTS, AND LUBRICITY IMPROVERS.
MSDS #	: 001178
Date of Preparation/Revision	: 1/24/2013.
In case of emergency	: 1-866-734-3438

Section 2. Hazards identification

Physical state	: Gas. [Liquefied gas]
Emergency overview	: DANGER! MAY BE FATAL IF INHALED. CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS. MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. Very toxic by inhalation. Corrosive to the eyes, skin and respiratory system. Causes burns. Do not breathe gas. Do not get in eyes or on skin or clothing. May cause target organ damage, based on animal data. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.
Target organs	: May cause damage to the following organs: upper respiratory tract, skin, eyes, eye, lens or cornea.
Potential acute health effects	
Eyes	: Corrosive to eyes. Causes burns. Liquid can cause burns similar to frostbite.
Skin	: Corrosive to the skin. Causes burns. Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
Inhalation	: Very toxic by inhalation. Corrosive to the respiratory system.
Ingestion	: May cause burns to mouth, throat and stomach. Ingestion of liquid can cause burns similar to frostbite.
Potential chronic health effects	
Target organs	: May cause damage to the following organs: upper respiratory tract, skin, eyes, eye, lens or cornea.
Medical conditions aggravated by over-exposure	: Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

Section 3. Composition, Information on Ingredients

United States

<u>Name</u>	<u>CAS number</u>	<u>% Volume</u>	<u>Exposure limits</u>
sulphur tetrafluoride	7783-60-0	100	ACGIH TLV (United States, 2/2010). C: 0.44 mg/m ³ C: 0.1 ppm NIOSH REL (United States, 6/2009). CEIL: 0.4 mg/m ³ CEIL: 0.1 ppm OSHA PEL 1989 (United States, 3/1989). CEIL: 0.4 mg/m ³

Section 4. First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact with liquid, warm frozen tissues slowly with lukewarm water. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Call medical doctor or poison control center immediately. Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : As this product rapidly becomes a gas when released, refer to the inhalation section.

Section 5. Fire-fighting measures

- Flammability of the product** : Non-flammable.
Not applicable.
- Products of combustion** : Decomposition products may include the following materials:
sulfur oxides
halogenated compounds
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up** : Immediately contact emergency personnel. Stop leak if without risk. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Contains gas under pressure. Do not get in eyes or on skin or clothing. Do not breathe gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.
- Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use.

Section 8. Exposure controls/personal protection

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Personal protection**
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn.
- Personal protection in case of a large spill** : Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product. Full chemical-resistant suit and self-contained breathing apparatus should be worn only by trained and authorized persons.

Product name

Exposure limits

United States

sulphur tetrafluoride

ACGIH TLV (United States, 2/2010).

C: 0.44 mg/m³

C: 0.1 ppm

NIOSH REL (United States, 6/2009).

CEIL: 0.4 mg/m³

CEIL: 0.1 ppm

OSHA PEL 1989 (United States, 3/1989).

CEIL: 0.4 mg/m³

CEIL: 0.1 ppm

Section 9. Physical and chemical properties

- Physical state** : Gas. [Liquefied gas]
- Color** : Gives off white fumes in moist air
- Odor** : Sulfurous.Pungent. Poor warning properties at low concentrations.
- Molecular weight** : 108.06 g/mole
- Molecular formula** : F₄-S
- Boiling/condensation point** : -40°C (-40°F)
- Melting/freezing point** : -124°C (-191.2°F)
- Critical temperature** : 196 °F (91 °C)
- Specific gravity** : NA
- Vapor pressure** : 140 psig at 70 deg F
- Vapor density** : 3.8 (Air=1)
- VOC** : 0 % (w/w)

Sulfur Tetrafluoride

Physical/chemical properties comments : Specific Volume (ft 3/lb) : 3.6101
Gas Density (lb/ft 3) : 0277

Section 10. Stability and reactivity

Stability and reactivity : The product is stable.

Incompatibility with various substances : Highly reactive or incompatible with the following materials: organic materials and moisture.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
sulphur tetrafluoride	LC50 Inhalation Gas.	Rat	40 ppm	1 hours

Chronic effects on humans : May cause damage to the following organs: upper respiratory tract, skin, eyes, eye, lens or cornea.

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material to humans.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

Aquatic ecotoxicity

Not available.



Products of degradation : Products of degradation: sulfur oxides (SO₂, SO₃ etc.), halogenated compounds.





Section 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Do not puncture or incinerate container. Empty pressure vessels should be returned to the supplier.

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN2418	SULFUR TETRAFLUORIDE	2.3	-	 	Limited quantity Yes. Packaging instruction Passenger aircraft Quantity limitation: Forbidden.

Sulfur Tetrafluoride						
						Cargo aircraft Quantity limitation: Forbidden. <u>Special provisions</u> 1
TDG Classification	UN2418	SULFUR TETRAFLUORIDE; OR SULPHUR TETRAFLUORIDE	2.3	-	 	<u>Explosive Limit and Limited Quantity Index</u> 0 <u>ERAP Index</u> 25 <u>Passenger Carrying Ship Index</u> Forbidden <u>Passenger Carrying Road or Rail Index</u> Forbidden <u>Special provisions</u> 38
Mexico Classification	UN2418	SULFUR TETRAFLUORIDE	2.3	-	 	<u>Limited quantity</u> Yes. <u>Packaging instruction Passenger aircraft</u> Quantity limitation: Forbidden. Cargo aircraft Quantity limitation: Forbidden. <u>Special provisions</u> 1

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Section 15. Regulatory information

United States

HCS Classification

: Compressed gas
Highly toxic material
Corrosive material
Target organ effects

U.S. Federal regulations

: **United States inventory (TSCA 8b):** This material is listed or exempted.
SARA 302/304/311/312 extremely hazardous substances: sulphur tetrafluoride
SARA 302/304 emergency planning and notification: sulphur tetrafluoride
SARA 302/304/311/312 hazardous chemicals: sulphur tetrafluoride
SARA 311/312 MSDS distribution - chemical inventory - hazard identification:
sulphur tetrafluoride: Sudden release of pressure, Immediate (acute) health hazard
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: sulphur tetrafluoride

State regulations

: **Connecticut Carcinogen Reporting:** This material is not listed.
Connecticut Hazardous Material Survey: This material is not listed.
Florida substances: This material is not listed.
Illinois Chemical Safety Act: This material is not listed.
Illinois Toxic Substances Disclosure to Employee Act: This material is not listed.
Louisiana Reporting: This material is not listed.
Louisiana Spill: This material is not listed.
Massachusetts Spill: This material is not listed.
Massachusetts Substances: This material is listed.
Michigan Critical Material: This material is not listed.
Minnesota Hazardous Substances: This material is not listed.
New Jersey Hazardous Substances: This material is listed.
New Jersey Spill: This material is not listed.
New Jersey Toxic Catastrophe Prevention Act: This material is listed.
New York Acutely Hazardous Substances: This material is listed.
New York Toxic Chemical Release Reporting: This material is not listed.
Pennsylvania RTK Hazardous Substances: This material is listed.
Rhode Island Hazardous Substances: This material is not listed.

Canada

WHMIS (Canada)

: Class A: Compressed gas.
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
Class E: Corrosive material
Class F: Dangerously reactive material.
CEPA Toxic substances: This material is not listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is not listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Section 16. Other information

Label requirements

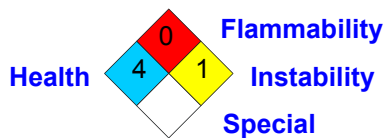
: MAY BE FATAL IF INHALED. CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS. MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.)

Health	*	4
Flammability		0
Physical hazards		3

Sulfur Tetrafluoride

National Fire Protection :
Association (U.S.A.)



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.