

# Germanium Tetrafluoride

## Safety Data Sheet P-4822

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1998    Revision date: 10/24/2016    Supersedes: 01/15/2015

### SECTION 1: Product and company identification

#### 1.1. Product identifier

Product form : Substance  
 Name : Germanium Tetrafluoride  
 CAS No : 7783-58-6  
 Formula : F4Ge  
 Other means of identification : Germanium (IV) Fluoride, tetrafluorogermane

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Industrial use. Use as directed.

#### 1.3. Details of the supplier of the safety data sheet

Praxair, Inc.  
 10 Riverview Drive  
 Danbury, CT 06810-6268 - USA  
 T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146  
[www.praxair.com](http://www.praxair.com)

#### 1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week  
 — Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887  
 (collect calls accepted, Contract 17729)

### SECTION 2: Hazard identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Liquefied gas H280  
 Acute Tox. 2 (Inhalation: gas) H330  
 Skin Corr. 1B H314  
 Eye Dam. 1 H318  
 STOT RE 1 H372

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



GHS04

GHS05

GHS06

GHS08

Signal word (GHS-US) :

DANGER

Hazard statements (GHS-US) :

H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED  
 H314 - CAUSES SEVERE SKIN BURNS AND EYE DAMAGE  
 H330 - FATAL IF INHALED  
 H372 - CAUSES DAMAGE TO ORGANS THROUGH PROLONGED OR REPEATED EXPOSURE

Precautionary statements (GHS-US) :

P202 - Do not handle until all safety precautions have been read and understood  
 P260 - Do not breathe gas  
 P262 - Do not get in eyes, on skin, or on clothing  
 P271+P403 - Use and store only outdoors or in a well-ventilated place  
 P280+P284 - Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection  
 P405 - Store locked up

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P501 - Dispose of contents/container in accordance with container Supplier/owner instructions  
 CGA-PG05 - Use a back flow preventive device in the piping  
 CGA-PG20+CGA-PG10 - Use only with equipment of compatible materials of construction and rated for cylinder pressure  
 CGA-PG12 - Do not open valve until connected to equipment prepared for use  
 CGA-PG18 - When returning cylinder, install leak tight valve outlet cap or plug  
 CGA-PG06 - Close valve after each use and when empty  
 CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

### 2.3. Other hazards

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

No data available

## SECTION 3: Composition/Information on ingredients

### 3.1. Substance

Name	Product identifier	%
Germanium Tetrafluoride (Main constituent)	(CAS No) 7783-58-6	100

### 3.2. Mixture

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First-aid measures after skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.. Get immediate medical attention.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects, both acute and delayed

No additional information available

### 4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

No additional information available

### 5.2. Special hazards arising from the substance or mixture

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

### 5.3. Advice for firefighters

Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

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Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems

Stop flow of product if safe to do so

Use water spray or fog to knock down fire fumes if possible.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Ensure adequate air ventilation. Evacuate area. Try to stop release. Monitor concentration of released product. Use chemically protective clothing. Evacuate area. Ensure adequate ventilation. Stop leak if safe to do so.

##### 6.1.1. For non-emergency personnel

No additional information available

##### 6.1.2. For emergency responders

No additional information available

#### 6.2. Environmental precautions

Try to stop release. Reduce vapor with fog or fine water spray. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

#### 6.3. Methods and material for containment and cleaning up

No additional information available

#### 6.4. Reference to other sections

See also sections 8 and 13.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Precautions for safe handling : Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

#### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods

**OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE:** When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

### 7.3. Specific end use(s)

None.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Germanium Tetrafluoride (7783-58-6)		
ACGIH	ACGIH TLV-TWA (ppm)	0.8
ACGIH	Not established	
USA OSHA	Not established	

### 8.2. Exposure controls

Appropriate engineering controls	: Use corrosion-proof equipment. Provide adequate general and local exhaust ventilation. Alarm detectors should be used when toxic gases may be released. Product to be handled in a closed system and under strictly controlled conditions. Preferably use only permanent leak-tight installations (e.g. welded pipes). Ensure exposure is below occupational exposure limits (where available).
Hand protection	: Wear chemically resistant protective gloves. The breakthrough time of the selected gloves must be greater than the intended use period. Consult glove manufacturer's product information on material suitability and material thickness.
Eye protection	: Wear safety glasses with side shields or goggles when transfilling or breaking transfer connections. Provide readily accessible eye wash stations and safety showers. Wear safety glasses with side shields.
Skin and body protection	: Wear chemically resistant protective gloves. Wear suitable protective clothing. Wear metatarsal shoes for container handling.
Respiratory protection	: When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).
Thermal hazard protection	: Wear cold insulating gloves when transfilling or breaking transfer connections.
Environmental exposure controls	: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.
Other information	: Keep suitable chemically resistant protective clothing readily available for emergency use. Wear leather safety gloves and safety shoes when handling cylinders.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	: Gas
Color	: Colorless
Odor	: No data available
Odor threshold	: No data available
pH	: Not applicable.
Relative evaporation rate (butyl acetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable.
Melting point	: No data available
Freezing point	: No data available
Boiling point	: -36.5 °C
Flash point	: No data available
Critical temperature	: 93.7 °C
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available

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Vapor pressure	: Not applicable.
Relative vapor density at 20 °C	: No data available
Relative density	: No data available
Solubility	: Water: No data available
Log Pow	: Not applicable.
Log Kow	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Explosive properties	: Not applicable.
Oxidizing properties	: None.
Explosion limits	: No data available

### 9.2. Other information

Gas group	: Liquefied gas
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## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

May occur.

### 10.4. Conditions to avoid

Avoid moisture in installation systems.

### 10.5. Incompatible materials

Water; Alkali metals; Alkaline earth metals; Calcium oxide; Organic materials; Silica Material.

### 10.6. Hazardous decomposition products

Germanium and its oxides. Hydrogen fluoride.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity	: Inhalation:gas: FATAL IF INHALED.
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Germanium Tetrafluoride ( f )7783-58-6	
LC50 inhalation rat (ppm)	280 ppm/1h
ATE US (gases)	163.000 ppmV/4h

Skin corrosion/irritation	: CAUSES SEVERE SKIN BURNS AND EYE DAMAGE. pH: Not applicable.
Serious eye damage/irritation	: CAUSES SERIOUS EYE DAMAGE. pH: Not applicable.
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: CAUSES DAMAGE TO ORGANS THROUGH PROLONGED OR REPEATED EXPOSURE.
Aspiration hazard	: Not classified

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### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

#### 12.2. Persistence and degradability

##### Germanium Tetrafluoride (7783-58-6)

Persistence and degradability	No ecological damage caused by this product.
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#### 12.3. Bioaccumulative potential

##### Germanium Tetrafluoride (7783-58-6)

Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

#### 12.4. Mobility in soil

##### Germanium Tetrafluoride (7783-58-6)

Mobility in soil	No data available.
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#### 12.5. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.  
 Effect on ozone layer : None

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

Waste disposal recommendations : Avoid release to the environment. Do not attempt to dispose of residual or unused quantities. Return container to supplier.

### SECTION 14: Transport information

In accordance with DOT

Transport document description : UN3308 Liquefied gas, toxic, corrosive, n.o.s. (Germanium Tetrafluoride), 2.3  
 UN-No.(DOT) : UN3308  
 Proper Shipping Name (DOT) : Liquefied gas, toxic, corrosive, n.o.s. (Germanium Tetrafluoride)  
 Class (DOT) : 2.3 - Class 2.3 - Poisonous gas 49 CFR 173.115  
 Hazard labels (DOT) : 2.3 - Poison Gas  
 2.3 - Poison gas  
 8 - Corrosive



DOT Symbols : G - Identifies proper shipping name (PSN) requiring the addition of technical name(s) in parentheses following the PSN, I - Proper shipping name appropriate for international and domestic transportation

DOT Special Provisions (49 CFR 172.102) : 2 - This material is poisonous by inhalation (see 171.8 of this subchapter) in Hazard Zone B (see 173.116(a) or 173.133(a) of this subchapter), and must be described as an inhalation hazard under the provisions of this subchapter  
 B9 - Bottom outlets are not authorized  
 B14 - Each bulk packaging, except a tank car or a multi-unit-tank car tank, must be insulated with an insulating material so that the overall thermal conductance at 15.5 C (60 F) is no more than 1.5333 kilojoules per hour per square meter per degree Celsius (0.075 Btu per hour per square foot per degree Fahrenheit) temperature differential. Insulating materials must not promote corrosion to steel when wet

#### Additional information

Other information : No supplementary information available.

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Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers:  
 - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

### Transport by sea

UN-No. (IMDG) : 3308  
 Proper Shipping Name (IMDG) : LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.  
 Class (IMDG) : 2 - Gases

### Air transport

UN-No. (IATA) : 3308  
 Proper Shipping Name (IATA) : Liquefied gas, toxic, corrosive, n.o.s.  
 Class (IATA) : 2

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Germanium Tetrafluoride (7783-58-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

SARA Section 311/312 Hazard Classes	Delayed (chronic) health hazard Immediate (acute) health hazard Reactive hazard Sudden release of pressure hazard
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All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

### 15.2. International regulations

#### CANADA

#### Germanium Tetrafluoride (7783-58-6)

Listed on the Canadian NDSL (Non-Domestic Substances List)

### EU-Regulations

#### Germanium Tetrafluoride (7783-58-6)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

### 15.2.2. National regulations

#### Germanium Tetrafluoride (7783-58-6)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
 Listed on the Korean ECL (Existing Chemicals List)

### 15.3. US State regulations

#### Germanium Tetrafluoride(7783-58-6)

U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No



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Germanium Tetrafluoride(7783-58-6)	
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

### SECTION 16: Other information

#### Other information

: When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc, it is the user's obligation to determine the conditions of safe use of the product

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#### NFPA health hazard

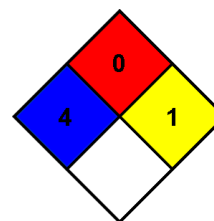
: 4 - Very short exposure could cause death or serious residual injury even though prompt medical attention was given.

#### NFPA fire hazard

: 0 - Materials that will not burn.

#### NFPA reactivity

: 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.



#### HMIS III Rating

Health : 4 Severe Hazard - Life-threatening, major or permanent damage may result from single or repeated overexposures

Flammability : 0 Minimal Hazard

Physical : 1 Slight Hazard

SDS US (GHS HazCom 2012) - Praxair

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*