



SAFETY DATA SHEET

SECTION 1 – IDENTIFICATION

Chemical Name: Sulfur Hexafluoride
Chemical Formula: SF₆
Chemical Family: Liquefied Gas
Hazard Classification: Sulfur Hexafluoride, Compressed, Non-Flammable Gas, UN1080, Green Label
Product Use Description: Analytical Standard and General Laboratory Applications
Company: MESA Specialty Gases & Equipment
2427 South Anne Street
Santa Ana, California 92704 USA
Phone Number for Information: Infotrac
Emergency Contact: 800-535-5053 (Int'l: 352-323-3500)

SECTION 2 – HAZARD(S) IDENTIFICATION

SIGNAL WORD - WARNING

HAZARD STATEMENTS: Contains gas under pressure; may explode if heated.
May cause suffocation by displacing oxygen in the air.

PRECAUTIONARY STATEMENTS:

General: Use in accordance with Safety Data Sheets.
Do not ingest or inhale. Avoid contact with skin and clothing.

Prevention: Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.

Response: Leaking gas fire: Do not extinguish unless leak can be stopped safely.
In case of leakage, eliminate all ignition sources.
Do not open valve until prepared to use.
Always use a back flow preventative device in piping.

Storage: Protect from sunlight. Store in a well-ventilated place.

OTHER HAZARDS: High pressure gas. May cause rapid suffocation.
May cause dizziness, nausea, drowsiness, vomiting, excess salivation, loss of mobility/consciousness.
May react explosively even in absence of air at elevated pressure and/or temperature.
Self-contained breathing apparatus (SCBA) may be required.



SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	CONCENTRATION
Sulfur Hexafluoride	2551-62-4	99.999%
Maximum impurities		0.001% (10 ppm)

SECTION 4 – FIRST AID MEASURES

Inhalation: Remove person to uncontaminated area. SCBA may be required to prevent asphyxiation of rescue workers. Keep warm and at rest. Lay victim face down with head and chest lower than hips to improve drainage from lungs. If breathing is labored, administer pure oxygen. If breathing has stopped, start artificial respiration. Get immediate medical attention for serious exposure.

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.

Skin contact: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion: N/A

SYMPTOMS: High concentrations of this gas can cause an oxygen-deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. The skin of a victim may have a blue color. Under some circumstances, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION SYMPTOMS OF EXPOSURE

12-16% Oxygen: Breathing and pulse rate increased, muscular coordination slightly disturbed.

10-14% Oxygen: Emotional upset, abnormal fatigue, disturbed respiration.

6-10% Oxygen: Nausea and vomiting, collapse or loss of consciousness.

Below 6%: Convulsive movements, possible respiratory collapse, and death.

OTHER POTENTIAL HEALTH EFFECTS: Contact with cryogenic liquid or rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Overexposure to Sulfur Hexafluoride may cause the following health effects:

ACUTE: The most significant hazard associated with this gas is inhalation of oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, headache, dizziness and nausea. At high concentrations, unconsciousness or death may occur. Contact with cryogenic liquid or rapidly expanding gases may cause frostbite.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to Sulfur Hexafluoride.

TARGET ORGANS: Respiratory system.

SULFUR HEXAFLUORIDE GAS

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	2
FLAMMABILITY		(RED)	0
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT			B
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

SECTION 5 – FIRE FIGHTING MEASURES

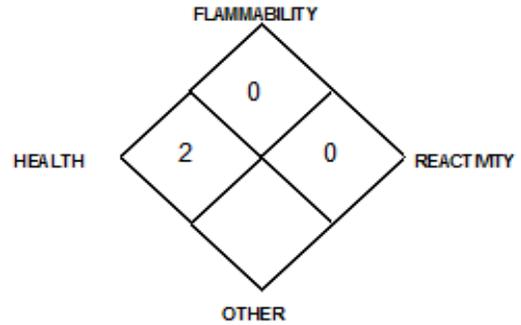
EXTINGUISHING MEDIA: Non-flammable, inert gas. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Sulfur Hexafluoride does not burn; however, containers may rupture violently when exposed to fire. Continue to cool fire exposed cylinders until flames are extinguished. Cylinder valve is equipped with a pressure relief device to safely vent the cylinder if it is exposed to elevated pressure in a fire.

SPECIAL FIRE FIGHTING PROCEDURES: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move fire-exposed cylinders if it can be done without risk to firefighters. Otherwise, cool containers with hose stream and protect personnel. Withdraw immediately in case of rising sounds from venting safety device or any discoloration of tanks due to the fire.

SULFUR HEXAFLUORIDE GAS

NFPA RATING



SECTION 6 – ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, AND EMERGENCY PROCEDURES: Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Monitor oxygen level. Ventilate the area.

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area and protect people.

Minimum Personal Protective Equipment should be Level B: protective clothing, mechanically-resistant gloves and Self-Contained Breathing Apparatus. Locate and seal the source of the leaking gas. Allow the gas to dissipate. Monitor the surrounding area for oxygen levels. The atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

ENVIRONMENTAL PRECAUTIONS: Prevent spreading of vapors through sewers, ventilation systems, and confined areas. Do not discharge materials into any place where their accumulation could be dangerous.

METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP: Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. Ventilate enclosed areas. Move leaking cylinder to fume hood or safe outdoor area. Use monitoring equipment if hazardous conditions are suspected or likely to occur.

SECTION 7 – HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING: Only experienced and properly instructed persons should handle compressed gases. Person is to know and understand the properties and hazards of the product before use. Do not remove or deface labels provided by the supplier for the identification of the product.

Protect cylinders against physical damage. Store in cool, dry, well-ventilated, fireproof area, away from flammable materials and corrosive atmospheres. Store away from heat and ignition sources and out of direct sunlight. Do not store near elevators, corridors or loading docks. Do not allow area where cylinders are stored to exceed 52°C (125°F). Isolate from incompatible materials such as magnesium (see Section 10, Stability and Reactivity for more information), which can react violently. Use only storage containers and equipment (pipes, valves, fittings to relieve pressure, etc.) rated for cylinder pressure. Do not store containers where they can come into contact with moisture. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting.

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap in-place (if provided), until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap (if provided). Mark empty cylinders "EMPTY".

NOTE: Use only DOT or ASME code containers. Earth-ground and bond all lines and equipment associated with this product. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, Safe Handling of Compressed Gases in Containers. See CGA P-9, the Inert Gases, Argon, Nitrogen, and Helium; CGA P-14, Accident Prevention in Oxygen Rich and Oxygen Deficient Atmospheres; CGA Safety Bulletin SB-2, Oxygen Deficient Atmospheres.

CONDITIONS FOR SAFE STORAGE: Cylinders should be secured with mounting brackets away from heavily traveled areas. Use oldest cylinders in stock first to prevent full cylinders from being stored for excessive periods of time. Full and empty cylinders should be segregated. Keep cylinder in dry, cool, well ventilated area away from heat, flame, sparks or corrosive chemicals. Cylinders should be moved by suitable hand trucks. Close valve after each use and when empty. Cylinder valve guards or caps should be in place. Cylinder temperature should not exceed 52°C (125°F). Store containers in location free from fire risk and away from any sources of heat and ignition. Keep cylinder away from combustible material. Use equipment rated for cylinder pressure.

SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

COMPONENT	OSHA PEL	ACGIH TLV
Sulfur Hexafluoride	1000 ppm	1000 ppm
<p>APPROPRIATE ENGINEERING CONTROLS: Use with adequate ventilation to maintain oxygen levels above 19.5% in the workplace. Local exhaust ventilation is preferred, because it prevents dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the level of oxygen.</p>		
<p>INDIVIDUAL PROTECTIVE MEASURES: Safety glasses, work gloves, and safety shoes should be worn when handling high pressure cylinders or hazardous materials.</p> <p>RESPIRATORY PROTECTION: Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen levels are below 19.5% or during emergency response to a release of Sulfur Hexafluoride. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standards.</p> <p>EYE PROTECTION: 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, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with sideshields.</p> <p>HAND PROTECTION: Wear chemical resistant-gloves when handling chemicals if a risk assessment indicates this is necessary.</p> <p>BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well provide sufficient insulation from extreme cold.</p>		

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Colorless	Upper/lower flammability/explosive limits: No data available
Odor: Odorless	Vapor Pressure: 16548 mmHg @ 20°C
Odor threshold: No data available	Vapor Density (Air=1): 5.1
pH: N/A	Relative Density (Water=1): 1.4
Melting point/range: -59.4°F (-50.8°C)	Solubility (in water): Slightly soluble
Boiling point/range: N/A	Partition coefficient (n-octanol/water): 1.68 (log = 0.226)
Flash Point: N/A	Auto-ignition temperature: No data available
Evaporation Rate (Butyl Acetate=1): N/A	Decomposition temperature: No data available
Flammability (solid, gas): No data available	Viscosity: 0.0156 Cp @ 25°C

SECTION 10 – STABILITY AND REACTIVITY DATA

Reactivity: No reactivity hazard other than the effects described in sub-sections below.	Conditions to avoid: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.
Chemical Stability: Stable under normal conditions	Incompatible materials: Explodes violently in contact with disilane.
Possibility of hazardous reactions: No data available	Hazardous Decomposition or Byproducts: Thermal decomposition may produce Fluorides and Sulfur Dioxide.

SECTION 11 – TOXICOLOGICAL INFORMATION

LIKELY ROUTES OF EXPOSURE:

Eye Irritation: No information on significant effects.

Skin Irritation: No information on significant effects.

SYMPTOMS/EFFECTS FROM EXPOSURE:

SYMPTOMS: High concentrations of this gas can cause an oxygen-deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. The skin of a victim may have a blue color. Under some circumstances, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION SYMPTOMS OF EXPOSURE

12-16% Oxygen: Breathing and pulse rate increased, muscular coordination slightly disturbed.

10-14% Oxygen: Emotional upset, abnormal fatigue, disturbed respiration.

6-10% Oxygen: Nausea and vomiting, collapse or loss of consciousness.

Below 6%: Convulsive movements, possible respiratory collapse, and death.

OTHER POTENTIAL HEALTH EFFECTS: No known significant or critical hazards.

ACUTE/CHRONIC TOXICITY: No data available.

CARCINOGENICITY: No data available.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity (aquatic and terrestrial): Any adverse effect on animals would be related to oxygen deficient environments. Sulfur Hexafluoride leaches through the soil and sediment at a moderate rate. No other adverse effect is anticipated to occur to plant-life, except for frost produced in the presence of rapidly expanding gases. No evidence is currently available on the effects of Sulfur Hexafluoride on aquatic life.

Persistence and degradability: No data available

Bioaccumulative potential: No data available

Mobility in soil: No data available

Other Effects: The mixture does not contain any class I or Class II ozone depleting chemicals.

SECTION 13 – DISPOSAL CONSIDERATIONS

Disposal: Waste disposal must be in accordance with appropriate National, Federal, State, and local regulations. Do not dispose or discharge into the environment. Do not discharge into enclosed environment. Contact supplier if additional guidance is required.

SECTION 14 – TRANSPORTATION INFORMATION

DOT Classification:

Proper Shipping Name: Sulfur Hexafluoride
Class: 2.2
UN/ID No.: UN1080
Label: Non-Flammable Gas, Green Label

IATA Classification:

Proper Shipping Name: Sulfur Hexafluoride
Class: 2.2
UN/ID No.: UN1080
Label: Non-Flammable Gas, Green Label

Environment hazard: No

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code: N/A

SPECIAL PRECAUTIONS FOR USER: Avoid transport on vehicles where the load space is not separated from driver's compartment. Ensure that transporter is aware of the potential hazards of the load and knows what to do in event of an emergency. Contact supplier for complete transportation information.

SECTION 15 – REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Sulfur Hexafluoride is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

CANADIAN DSL/NDL INVENTORY STATUS: Sulfur Hexafluoride is on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Sulfur Hexafluoride is on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Sulfur Hexafluoride is covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: No. California - Proposition 65 Lists: No. Florida - Substance List: No. Illinois - Toxic Substance List: No.

Kansas - Section 302/313 List: No. Massachusetts - Right to Know List: Yes. Michigan - Critical Materials Register: No. Minnesota - List of Hazardous Substances: No. Missouri - Employer Information/Toxic Substance List: No. New Jersey - Right to Know Hazardous Substance List: Yes.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: No. Pennsylvania - Right to Know List: Yes. Rhode Island - Hazardous Substance List: No. Texas - Hazardous Substance List: No. West Virginia - Hazardous Substance List: No. Wisconsin - Toxic and Hazardous Substances: No. Listed

Listed on the AICS (Australian Inventory of Chemical Substances)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)

Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory

Listed on the Korean ECL (Existing Chemicals List)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

Listed on the Canadian IDL (Ingredient Disclosure List)

Listed on INSQ (Mexican National Inventory of Chemical Substances)

Listed on CICR (Turkish Inventory and Control of Chemicals)

LABELING (For Compressed Gas):

WARNING: CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED. MAY CAUSE RAPID SUFFOCATION BY DISPLACING OXYGEN IN THE AIR. MAY INCREASE RESPIRATION AND HEART RATE. May cause dizziness, nausea, drowsiness, vomiting, excess salivation, and loss of mobility/consciousness. May cause frostbite. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources—No smoking. Use and store in well-ventilated areas. Leaking gas fire: Do not extinguish unless leak can be stopped safely. In case of leakage, eliminate all ignition sources. Do not open valve until prepared to use. Always use a backflow preventative device in piping. Use only with equipment rated for cylinder pressure. Close valve after each use and when empty. Cylinder temperature should not exceed 52°C (125°F). Use in accordance with Safety Data Sheet. FIRST AID: IF INHALED, remove to fresh air. If breathing is difficult, give Oxygen. Call a physician. IN CASE OF FROSTBITE, obtain immediate medical attention. DO NOT REMOVE THIS LABEL.

SECTION 16 – OTHER INFORMATION

Information contained in this data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable. But the accuracy and completeness thereof, is not guaranteed and no warranty of any kind, either expressed or implied, is made with respect thereto. Since MESA Specialty Gases and Equipment Division of MESA International Technologies, Inc. shall have no control over the use of the product described herein, we assume no liability for loss or damage incurred from the proper or improper use of such product.

HISTORY:

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