

SAFETY DATA SHEET



Sulfur Hexafluoride

Section 1. Identification

1.1 Product identifier : Sulfur Hexafluoride - High Pressure Vessel
Product name : E7200-80009, E7200-80059, E7200-89009 & 89059, E7200-89009-DEF, E7200-89009 & 89059-DEF, N7210-80009, N7210-80059
Part No.
Validation date 05/17/2017.

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

Material uses : Analytical chemistry.
(used in wave guides and x-ray tubes)

1.3 Details of the supplier of the safety data sheet

Supplier/Manufacturer : Keysight Technologies, Inc.
1400 Fountaingrove Parkway
Santa Rosa, California 95403

1.4 Emergency telephone number

In case of emergency : (707) 577-3000
Monday - Friday 8:00 - 5:00

Section 2. Hazards identification

2.1 Classification of the substance or mixture

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture

H280 GASES UNDER PRESSURE - Liquefied gas

2.2 GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : H280 - Contains gas under pressure; may explode if heated.

Precautionary statements

Prevention : Not applicable.

Response : Not applicable.

Storage : P410 - Protect from sunlight.
P403 - Store in a well-ventilated place.

Disposal : Not applicable.

2.3 Other hazards

Hazards not otherwise classified : Acts as a simple asphyxiant. At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen. Liquid can cause burns similar to frostbite.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Ingredient name	%	CAS number
Sulphur hexafluoride	60 - 100	2551-62-4

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

4.1 Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if adverse health effects persist or are severe. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. As this product rapidly becomes a gas when released, refer to the inhalation section.

4.2 Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Liquid can cause burns similar to frostbite.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
- Ingestion** : Ingestion of liquid can cause burns similar to frostbite.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
frostbite
- Inhalation** : No specific data.
- Skin contact** : Adverse symptoms may include the following:
frostbite
- Ingestion** : Adverse symptoms may include the following:
frostbite

Section 4. First aid measures

4.3 Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

5.1 Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.

5.2 Special hazards arising from the substance or mixture

- Specific hazards arising from the chemical** : Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
sulfur oxides
halogenated compounds
Hydrogen fluoride (HF).

5.3 Advice for firefighters

- Special protective actions for fire-fighters** : 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.
- 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. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.
- Remark** : Emits toxic fumes when heated.

Section 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : 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. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 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).

Section 6. Accidental release measures

6.3 Methods and materials for containment and cleaning up

Immediately contact emergency personnel. Stop leak if without risk.

Section 7. Handling and storage

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Avoid breathing gas. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.

Advice on general occupational hygiene : 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. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

: Do not store above the following temperature: 51.667°C (125°F). Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight 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.

7.3 Specific end use(s)

Recommendations : Industrial applications, Professional applications.

Industrial sector specific solutions : Not applicable.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Sulphur hexafluoride	<p>ACGIH TLV (United States, 6/2013). TWA: 1000 ppm 8 hours. TWA: 5970 mg/m³ 8 hours.</p> <p>OSHA PEL 1989 (United States, 3/1989). TWA: 1000 ppm 8 hours. TWA: 6000 mg/m³ 8 hours.</p> <p>NIOSH REL (United States, 10/2013). TWA: 1000 ppm 10 hours. TWA: 6000 mg/m³ 10 hours.</p> <p>OSHA PEL Z2 (United States, 2/2013). TWA: 2.5 mg/m³ 8 hours. Form: Dust</p> <p>OSHA PEL (United States, 2/2013). TWA: 1000 ppm 8 hours. TWA: 6000 mg/m³ 8 hours.</p>

8.2 Exposure controls

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Section 8. Exposure controls/personal protection

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

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.

Eye/face 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 side-shields.

Skin protection

Hand protection : 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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : 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.

Other skin protection : Appropriate footwear and any additional skin protection measures 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 protection : 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.

Section 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state : Gas.

Color : Colorless.

Odor : Odorless.

Odor threshold : Not available.

pH : Not available.

Melting point : -50.8°C (-59.4°F)

Boiling point : Not available.

Flash point : Not available.

Evaporation rate : Not available.

Flammability (solid, gas) : Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
Emits toxic fumes when heated.

Section 9. Physical and chemical properties

Lower and upper explosive (flammable) limits	: Not available.
Vapor pressure	: 2.9 kPa (21.5 mm Hg) [room temperature]
Vapor density	: 5 [Air = 1]
Relative density	: 1.9 [Water = 1]
Solubility	: Soluble in the following materials: diethyl ether. Partially soluble in the following materials: methanol. Very slightly soluble in the following materials: cold water and hot water.
Solubility in water	: 0.0004 g/l
Partition coefficient: n-octanol/water	: 1.68
Auto-ignition temperature	: Not available.
Decomposition temperature	: >204.44°C (>400°F)
Viscosity	: Dynamic (room temperature): 0.0156 mPa·s (0.0156 cP)

Section 10. Stability and reactivity

10.1 Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: The product is stable.
10.3 Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	: No specific data.
10.5 Incompatible materials	: Reactive or incompatible with the following materials: oxidizing materials, combustible materials and metals. Slightly reactive or incompatible with the following materials: organic materials. Hydrogen fluoride (HF).
10.6 Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Section 11. Toxicological information

Product/ingredient name	OSHA	IARC	NTP
Sulphur hexafluoride	-	3	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Routes of entry anticipated: Inhalation.

Potential acute health effects

- Eye contact** : Liquid can cause burns similar to frostbite.
Inhalation : No known significant effects or critical hazards.
Skin contact : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
Ingestion : Ingestion of liquid can cause burns similar to frostbite.

Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following:
frostbite
Inhalation : No specific data.
Skin contact : Adverse symptoms may include the following:
frostbite
Ingestion : Adverse symptoms may include the following:
frostbite

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

- Potential immediate effects** : Not available.
Potential delayed effects : Not available.

Long term exposure

- Potential immediate effects** : Not available.
Potential delayed effects : Not available.

Potential chronic health effects

- General** : No known significant effects or critical hazards.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.

Section 11. Toxicological information

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Other information : Adverse symptoms may include the following: nausea or vomiting, drowsiness/fatigue, dizziness/vertigo, convulsive seizures, coma.

Section 12. Ecological information

12.1 Toxicity

Not available.

12.2 Persistence and degradability

Not available.

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Sulphur hexafluoride	1.68	-	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : 195

12.5 Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

13.1 Waste treatment methods

Disposal methods : The generation of waste should be avoided or minimized wherever possible. 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. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.






Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Section 13. Disposal considerations

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT	UN1080	Sulfur hexafluoride	2.2	-		<p>Limited quantity Yes.</p> <p>Packaging instruction Passenger aircraft Quantity limitation: 75 kg Packaging instructions: 173.304</p> <p>Cargo aircraft Quantity limitation: 150 kg</p>
TDG	UN1080	SULFUR HEXAFLUORIDE	2.2	-		<p>Explosive Limit and Limited Quantity Index 0.12</p> <p>Passenger Carrying Road or Rail Index 75</p>
Mexico	UN1080	HEXAFLOURO DE AZUFRE	2.2	-		-
IMDG	UN1080	SULPHUR HEXAFLUORIDE	2.2	-		<p>Emergency schedules (EmS) F-C, S-V</p>
IATA	UN1080	Sulphur hexafluoride	2.2	-		<p>Passenger and Cargo Aircraft Quantity limitation: 75 kg Packaging instructions: 200</p> <p>Cargo Aircraft Only Quantity limitation: 150 kg Packaging instructions: 200</p> <p>Limited Quantities - Passenger Aircraft Quantity limitation: Forbidden Packaging instructions: Forbidden</p>

Section 14. Transport information

PG* : Packing group

Section 15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Federal regulations : **United States inventory (TSCA 8b)**: This material is listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Sudden release of pressure

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Sulphur hexafluoride	60 - 100	No.	Yes.	No.	No.	No.

State regulations

Massachusetts : This material is listed.

New York : This material is not listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

California Prop. 65

No products were found.

Canada inventory : This material is listed or exempted.

International regulations

International lists :

- Australia inventory (AICS)**: This material is listed or exempted.
- China inventory (IECSC)**: This material is listed or exempted.
- Japan inventory**: This material is listed or exempted.
- Korea inventory**: This material is listed or exempted.
- Malaysia Inventory (EHS Register)**: Not determined.
- New Zealand Inventory of Chemicals (NZIoC)**: This material is listed or exempted.
- Philippines inventory (PICCS)**: This material is listed or exempted.
- Taiwan inventory (CSNN)**: This material is listed or exempted.

Section 15. Regulatory information

**Chemical Weapons
Convention List Schedule
I Chemicals** : Not listed

**Chemical Weapons
Convention List Schedule
II Chemicals** : Not listed

**Chemical Weapons
Convention List Schedule
III Chemicals** : Not listed

Section 16. Other information

History

Date of issue : 05/17/2017.

Date of previous issue : 06/09/2015.

Version : 4

✔ Indicates information that has changed from previously issued version.

Notice to reader

Disclaimer: The information contained in this document is based on Keysight's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.