SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- Trade name: SULFUR HEXAFLUORIDE
- Chemical name: Sulfur hexafluoride
- Molecular formula: SF6

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

Uses of the Substance / Mixture

- Electronic industry
- Metallurgy.

1.3 Details of the supplier of the safety data sheet

Company

SOLVAY FLUORIDES, LLC
3737 Buffalo Speedway,
Suite 800,
Houston, TX 77098
USA
Tel: 800-515-6065

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CONTACT CHEMTREC (24-Hour Number): 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although WHMIS has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects

2.1 Classification of the substance or mixture

Hazardous Products Regulations (WHMIS 2015)

Gases under pressure, Liquefied gas
Simple Asphyxiant, Category 1
H280: Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

2.2 Label elements

Hazardous Products Regulations (WHMIS 2015)

Pictogram

Signal Word
- Warning

Hazard Statements
- H280 Contains gas under pressure; may explode if heated.
Precautionary Statements

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

Disposal
- 

2.3 Other hazards which do not result in classification
- Liquefied gas
- Hazardous decomposition products formed under fire conditions.
- Gaseous hydrogen fluoride (HF).
- Causes asphyxiation in high concentrations.
- Hazardous decomposition products formed under fire conditions.

SECTION 3: Composition/information on ingredients

3.1 Substance

WHMIS Hazardous Ingredients and Impurities

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Identification number</th>
<th>Concentration [% wt/wt or V/V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur fluoride (SF6), (OC-6-11)-</td>
<td>2551-62-4</td>
<td>&gt;= 99 - &lt; 100</td>
</tr>
</tbody>
</table>

3.2 Mixture
Not applicable, this product is a substance.

SECTION 4: First aid measures

4.1 Description of first-aid measures

In case of inhalation
- Remove to fresh air.
- Oxygen or artificial respiration if needed.
- If symptoms persist, call a physician.

Exposure to decomposition products
- Remove to fresh air.
- Immediate medical attention is required.

In case of skin contact
- Allow to evaporate.
- Wash off with warm water.
- If symptoms persist, call a physician.

In case of eye contact
- Allow to evaporate.
- Rinse thoroughly with plenty of water, also under the eyelids.
4.2 Most important symptoms and effects, both acute and delayed

In case of inhalation

Symptoms
- At high concentrations:
  - narcosis
  - Asphyxia

In case of skin contact

Symptoms
- Cold sensation followed by redness of the skin.
- Frostbite

Effects
- gas
- none
- Liquefied gas
- Prolonged skin contact may defat the skin and produce dermatitis.

In case of eye contact

Symptoms
- Irritation
- Lachrymation
- Redness
- Swelling of tissue
- Frostbite

Effects
- gas
- Liquefied gas
- Severe eye irritation
- Causes burns.

In case of ingestion

Effects
- gas
- Not applicable

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician
- When symptoms persist or in all cases of doubt seek medical advice.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
5.2 Special hazards arising from the substance or mixture

**Specific hazards during fire fighting**
- The product is not flammable.
- Hazardous decomposition products formed under fire conditions.
- Gas/vapors combustion possible in presence of air in very particular conditions (see section 9 and/or consult the producer).

**Hazardous combustion products:**
- Gaseous hydrogen fluoride (HF).
- Fluorophosgene
- The release of other hazardous decomposition products is possible.
- Sulfur oxides
- Sulfur compounds

5.3 Advice for firefighters

**Special protective equipment for fire-fighters**
- Wear self-contained breathing apparatus and protective suit.
- Wear chemical resistant oversuit

**Further information**
- Approach from upwind.
- Evacuate personnel to safe areas.
- Keep containers and surroundings cool with water spray.
- After the fire, proceed rapidly with cleaning of surfaces exposed to the fumes in order to limit equipment damage.

---

**SECTION 6: Accidental release measures**

6.1 Personal precautions, protective equipment and emergency procedures

**Advice for non-emergency personnel**
- Prevent further leakage or spillage if safe to do so.
- Keep away from incompatible products

**Advice for emergency responders**
- Approach from upwind.
- Suppress (knock down) gases/vapors/mists with a water spray jet.
- Avoid spraying the leak source.
- Try to re-position leaking containers, to have the leak in the gaseous phase.
- Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.
- Keep away from open flames, hot surfaces and sources of ignition.

6.2 Environmental precautions
- Discharge into the environment must be avoided.
- Inform the responsible authorities in case of gas leakage, or of entry into waterways, soil or drains.
- Should not be released into the environment.

6.3 Methods and materials for containment and cleaning up
- Allow to evaporate.
- Prevent product from entering sewage system.

6.4 Reference to other sections
- Refer to protective measures listed in sections 7 and 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
- Used in closed system
- Use only equipment and materials which are compatible with the product.
- Prevent any product decomposition from contacting hot spots.
- Prevent product vapors decomposition from electric arc action (welding).
- Use only equipment and materials which are compatible with the product.
- Prevent any product decomposition from contacting hot spots.
- Prevent product vapors decomposition from electric arc action (welding).
- Keep away from heat.
- Keep away from incompatible products

Hygiene measures
- Eye wash bottles or eye wash stations in compliance with applicable standards.
- When using do not eat, drink or smoke.
- Gloves, overalls and boots have to be double layered (protection against cold temperature).
- Handle in accordance with good industrial hygiene and safety practice.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions
- Keep only in the original container.
- Keep in properly labeled containers.
- Keep in a contained area.
- Keep away from sources of ignition - No smoking.
- Keep in a well-ventilated place.
- Refer to protective measures listed in sections 7 and 8.
- Keep away from:
  - Incompatible products

Packaging material

Suitable material
- Steel drum

Requirements for storage rooms and vessels

Recommended storage temperature: < 122 °F (< 50 °C)

7.3 Specific end use(s)
- Contact your supplier for additional information

SECTION 8: Exposure controls/personal protection

Introductory Remarks: These recommendations provide general guidance for handling this product. Because specific work
environments and material handling practices vary, safety procedures should be developed for each intended application. Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

8.1 Control parameters

\textbf{Components with workplace occupational exposure limits}

Consult local authorities for acceptable exposure limits.

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur fluoride (SF6), (OC-6-11)-</td>
<td>TWA</td>
<td>1,000 ppm</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td></td>
<td>Asphyxia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8.2 Exposure controls

\textbf{Control measures}

\textbf{Engineering measures}
- Ensure adequate ventilation.
- Apply technical measures to comply with the occupational exposure limits.

\textbf{Individual protection measures}

\textbf{Respiratory protection}
- Use NIOSH approved respiratory protection.
- Wear self-contained breathing apparatus in confined spaces, in cases where the oxygen level is depleted, or in case of significant emissions.
- Use only respiratory protection that conforms to international/ national standards.
- Self-contained breathing apparatus in confined spaces/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.

\textbf{Hand protection}
- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
- Protective gloves

\textbf{Suitable material}
- PVC
- Neoprene
- Natural Rubber

\textbf{Eye protection}
- Chemical resistant goggles must be worn.

\textbf{Skin and body protection}
- Wear suitable protective clothing.

\textbf{Hygiene measures}
- Eye wash bottles or eye wash stations in compliance with applicable standards.
- When using do not eat, drink or smoke.
- Gloves, overalls and boots have to be double layered (protection against cold temperature).
- Handle in accordance with good industrial hygiene and safety practice.
SECTION 9: Physical and chemical properties

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>Form</td>
<td>Liquefied gas</td>
</tr>
<tr>
<td>Physical state</td>
<td>gaseous</td>
</tr>
<tr>
<td>Color</td>
<td>colorless</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>odorless</td>
</tr>
<tr>
<td><strong>Odor Threshold</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Molecular weight</strong></td>
<td>146 g/mol</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>neutral</td>
</tr>
<tr>
<td><strong>Melting point/freezing point</strong></td>
<td>Freezing point: -59.4 °F (-50.8 °C)</td>
</tr>
<tr>
<td><strong>Initial boiling point and boiling range</strong></td>
<td>Boiling point/boiling range: -82.8 °F (-63.8 °C)</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Evaporation rate (Butylacetate = 1)</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>The product is not flammable.</td>
</tr>
<tr>
<td><strong>Flammability / Explosive limit</strong></td>
<td>Explosiveness:</td>
</tr>
<tr>
<td></td>
<td>Not expected</td>
</tr>
<tr>
<td><strong>Autoignition temperature</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Vapor pressure</strong></td>
<td>17,776.46 mmHg (23,700 hPa) (77 °F (25 °C))</td>
</tr>
<tr>
<td><strong>Vapor density</strong></td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Relative density</strong></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Sulfur hexafluoride</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>Water solubility:</td>
</tr>
<tr>
<td></td>
<td>0.031 g/l (77 °F (25 °C))</td>
</tr>
<tr>
<td></td>
<td>slightly soluble</td>
</tr>
<tr>
<td><strong>Solubility in other solvents:</strong></td>
<td>Alcohol: soluble</td>
</tr>
<tr>
<td></td>
<td>Ether: soluble</td>
</tr>
</tbody>
</table>
Partition coefficient: n-octanol/water  log Pow: 1.68

Decomposition temperature  <= 392 °F (<= 200 °C)
Exposure to moisture.

Decomposition temperature  <= 1472 °F (<= 800 °C)
dry air, Specific conditions

Viscosity  No data available

Explosive properties  No data available
Oxidizing properties  Not considered as oxidizing.

9.2 Other information

Henry's Constant  ca. 458000 Pa.m^3 / mol (77 °F (25 °C))
Method: Calculation method
considerable volatility, Air

Surface tension  8.02 mN/m (68 °F (20 °C))

SECTION 10: Stability and reactivity

10.1 Reactivity
- Decomposition can be accelerated under influence of moisture.
- Decomposition temperature will be decreased.

10.2 Chemical stability
- Stable under recommended storage conditions.
- Strong oxidizers, alkali metals and alkaline earth metals may cause fires or explosions.
- Vapors are heavier than air and may spread along floors.

10.3 Possibility of hazardous reactions
- polymerization
  - Hazardous polymerization does not occur.

10.4 Conditions to avoid
- Heat.
- In case of heating:
  - Exposure to moisture.
  - Keep away from direct sunlight.

10.5 Incompatible materials
- Oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products
- Gaseous hydrogen fluoride (HF).
- Sulfur oxides
- Sulfur compounds
  Thionyl fluoride
  Disulfur decafluoride

SECTION 11: Toxicological information

11.1 Information on toxicological effects

**Acute toxicity**

**Acute oral toxicity**
Not applicable

**Acute inhalation toxicity**
The product has a low acute toxicity

**Asphyxiation Hazard**
This product is a simple asphyxiant.

**Acute dermal toxicity**
Not applicable

**Acute toxicity (other routes of administration)**
No data available

**Skin corrosion/irritation**
No skin irritation

**Serious eye damage/eye irritation**
No eye irritation

**Respiratory or skin sensitization**
no observed effect

**Mutagenicity**

**Genotoxicity in vitro**
In vitro tests did not show mutagenic effects

**Genotoxicity in vivo**
In vivo tests did not show mutagenic effects

**Carcinogenicity**
No data available

This product does not contain any ingredient designated as probable or suspected human carcinogens by: ACGIH
Toxicity for reproduction and development

Toxicity to reproduction / fertility
Reproduction / developmental toxicity screening test - Rat, male and female
Inhalation
Fertility NOAEC Parent: 50,000 ppm
Method: OECD Test Guideline 422

Developmental Toxicity/Teratogenicity
Inhalation
Teratogenicity NOAEC: 50,000 ppm
Method: OECD Test Guideline 422
Reproduction / developmental toxicity screening test

STOT
STOT-single exposure
No data available

STOT-repeated exposure
The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.

Inhalation 28-day - Rat, male and female
NOAEC: 50000 ppm(m)
no observed effect

Inhalation 90-day - Rat, male and female
NOAEC: 20000 ppm(m)
Method: OECD Test Guideline 413
no observed effect

Experience with human exposure
No data available

Aspiration toxicity
No data available

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment
Acute toxicity to fish

LC50 - 96 Days: 236 mg/l - Fish
Method: Calculation method
Acute toxicity to daphnia and other aquatic invertebrates.

LC50 - 48 h : 247 mg/l - Crustaceans
Method: Calculation method
Water

Toxicity to aquatic plants

EC50 - 96 h : 151 mg/l - Algae
Method: Calculation method
Water

Toxicity to microorganisms

No data available

Chronic toxicity to fish

No data available

Chronic toxicity to daphnia and other aquatic invertebrates.

No data available

Chronic Toxicity to aquatic plants

No data available

12.2 Persistence and degradability

Abiotic degradation

Stability in water

t 1/2 (Hydrolysis): t 1/2 (Hydrolysis): Hydrolysis time: > 1,000 y
non-significant hydrolysis, Medium, Water, Soil

Photodegradation

Half-life indirect photolysis: > 1,000 y
Air
non-significant photolysis

Physical- and photo-chemical elimination

No data available

Biodegradation

Biodegradability

The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water
No data available

Bioconcentration factor (BCF)

Not potentially bioaccumulable
12.4 Mobility in soil

Adsorption potential (Koc)

Soil/sediments
non-significant adsorption

Water
Method: Calculation method
The product evaporates readily.

Known distribution to environmental compartments
No data available

12.5 Results of PBT and vPvB assessment
This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects

Ozone-Depletion Potential
Regulatory basis: Global warming potential
Ozone-Depletion Potential: 23.900
Halocarbon global warming potential; HGWP; (R-11 = 1)

Global warming potential
Regulatory basis: The Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC)
20-year global warming potential: 17,500
100-year global warming potential: 23,500
Radiative efficiency: 0.57 Wm2ppb
Additional Information: Fully Fluorinated Species

Remarks
This product has no known ecotoxicological effects., Product is persistent in air., Other dangerous properties can not be excluded.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal
- In accordance with local and national regulations.
- Refer to manufacturer/supplier for information on recovery/recycling.

Advice on cleaning and disposal of packaging
- To avoid treatments, as far as possible, use dedicated containers.

SECTION 14: Transport information

Transportation status: IMPORTANT! Statements below provide additional data on listed transport classification.
The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

**TDG**

14.1 UN number UN 1080
14.2 Proper shipping name SULFUR HEXAFLUORIDE
14.3 Transport hazard class 2.2
Label(s) 2.2
14.4 Packing group
Packing group
ERG No 126
14.5 Environmental hazards
Marine pollutant NO

**DOT**

14.1 UN number UN 1080
14.2 Proper shipping name SULFUR HEXAFLUORIDE
14.3 Transport hazard class 2.2
Label(s) 2.2
14.4 Packing group
Packing group
ERG No 126
14.5 Environmental hazards
Marine pollutant NO

**NOM**

14.1 UN number UN 1080
14.2 Proper shipping name SULPHUR HEXAFLUORIDE
14.3 Transport hazard class 2.2
Label(s) 2.2
14.4 Packing group
Packing group
ERG No 126
14.5 Environmental hazards
Marine pollutant NO

**IMDG**

14.1 UN number UN 1080
14.2 Proper shipping name SULPHUR HEXAFLUORIDE
14.3 Transport hazard class
Label(s) 2.2

14.4 Packing group
Packing group

14.5 Environmental hazards
Marine pollutant NO

14.6 Special precautions for user
EmS F-C, S-V
For personal protection see section 8.

IATA

14.1 UN number UN 1080
14.2 Proper shipping name SULPHUR HEXAFLUORIDE
14.3 Transport hazard class 2.2
Label(s): 2.2

14.4 Packing group
Packing instruction (cargo aircraft) 200
Max net qty / pkg 150.00 kg
Packing instruction (passenger aircraft) 200
Max net qty / pkg 75.00 kg

14.5 Environmental hazards NO

14.6 Special precautions for user
For personal protection see section 8.

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.
SAFETY DATA SHEET

SULFUR HEXAFLUORIDE

SECTION 15: Regulatory information

15.1 Notification status

<table>
<thead>
<tr>
<th>Inventory Information</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States TSCA Inventory</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>Mexico INSQ (INSQ)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>Canadian Domestic Substances List (DSL)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>New Zealand. Inventory of Chemical Substances</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>Australia Inventory of Chemical Substances (AICS)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>Japan. CSCL - Inventory of Existing and New Chemical Substances</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>Korea. Korean Existing Chemicals Inventory (KECI)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>China. Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>Philippines Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>EU. European Registration, Evaluation, Authorisation and Restriction of Chemical (REACH)</td>
<td>- When purchased from a European Solvay legal entity, this product is compliant with the registration provisions of the REACH Regulation (EC) No. 1907/2006 as all its components are either excluded, exempt, pre-registered and/or registered. When purchased from a legal entity outside of Europe, please contact your local representative for additional information.</td>
</tr>
</tbody>
</table>

15.2 National Regulations

No data available

SECTION 16: Other information

Revision Date:
01/18/2018

NFPA (National Fire Protection Association) - Classification

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Instability or Reactivity</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Special Notices</td>
<td>None</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

SULFUR HEXAFLUORIDE

Revision Date 01/18/2018

HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification

<table>
<thead>
<tr>
<th>Health</th>
<th>0 minimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Reactivity</td>
<td>0 minimal</td>
</tr>
<tr>
<td>PPE</td>
<td>Determined by User; dependent on local conditions</td>
</tr>
</tbody>
</table>

Further information

- This sheet was updated (refer to the date at the top of this page). Subheadings and text which have been modified since the previous version are indicated with two vertical bars.

Key or legend to abbreviations and acronyms used in the safety data sheet

- TWA 8-hour, time-weighted average
- ACGIH American Conference of Governmental Industrial Hygienists
- OSHA Occupational Safety and Health Administration
- NTP National Toxicology Program
- IARC International Agency for Research on Cancer
- NIOSH National Institute for Occupational Safety and Health

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.