

Safety Data Sheet

Version 3.0
Revision Date 01/21/2015

SDS Number 300000030858
Print Date 09/06/2015

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : XeF2

Chemical formula : XeF2

Product Use Description : Semiconductor Processing

Manufacturer/Importer/Distributor : Air Products and Chemicals, Inc
7201 Hamilton Blvd.
Allentown, PA 18195-1501
GST No. 123600835 RT0001
QST No. 102753981 TQ0001

Telephone : 1-610-481-4911 Corporate
1-800-345-3148 Chemicals Cust Serv
1-800-752-1597 Gases/Electronics Cust Serv

Emergency telephone number (24h) : 800-523-9374 USA
+1 610 481 7711 International

2. HAZARDS IDENTIFICATION

GHS classification

Oxidizing solids - Category 1
Acute toxicity - Oral Category 3
Acute toxicity - Inhalation Category 3
Skin corrosion - Category 1B

GHS label elements

Hazard pictograms/symbols



Signal Word: Danger

Hazard Statements:

Safety Data Sheet

Version 3.0

Revision Date 01/21/2015

SDS Number 300000030858

Print Date 09/06/2015

H271:May cause fire or explosion; strong oxidiser.

H301+H331:Toxic if swallowed or if inhaled

H314:Causes severe skin burns and eye damage.

Precautionary Statements:

- Prevention : :Keep away from heat.
P220:Keep away from clothing and other combustible materials.
:Take any precaution to avoid mixing with combustibles.
P260a:Do not breathe dust or mist.
P264:Wash hands thoroughly after handling.
P280:Wear protective gloves/protective clothing/eye protection/face protection.
- Response : P301+P310 :IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P301+P330+P331 :IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P305+P351+P338 :IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 :Immediately call a POISON CENTRE or doctor/physician.
P370+P378 :In case of fire, use recommended extinguishing media for extinction.
:In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.
- Storage : P403+P233:Store in a well-ventilated place. Keep container tightly closed.
P405:Store locked up.
- Disposal : P501:Disposal of contents/container to be specified in accordance with regulations.

Hazards not otherwise classified

Corrosive

Oxidant. Strongly supports combustion. May react violently with combustible materials.

Oxidizer, will increase risk of fire or the intensity of a fire. Emergency responders must practice extreme caution when approaching, because of the reactivity potential; may cause violent and sometimes explosive reactions.

Decomposes in contact with water.

Toxic if swallowed.

Toxic by inhalation.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Concentration (Weight)
Xenon Difluoride	13709-36-9	> 99%

4. FIRST AID MEASURES

Safety Data Sheet

Version 3.0

Revision Date 01/21/2015

SDS Number 300000030858

Print Date 09/06/2015

General advice	: Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.
Eye contact	: Hold eyelids apart, initiate and maintain gentle and continuous irrigation until the patient receives medical care. If medical care is not promptly available, continue to irrigate for one hour.
Skin contact	: Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay. Flush immediately with copious amounts of water. Initiate and maintain continuous irrigation until the patient receives medical care. If medical care is not promptly available, continue to irrigate for one hour. Cover wound with sterile dressing. Potential for hydrogen fluoride formation exists, which may cause additional tissue destruction and possibly a systemic reaction that can be fatal.
Ingestion	: Never give anything by mouth to an unconscious person. Prevent aspiration of vomit. Turn victim's head to the side.
Inhalation	: Move to fresh air.
Most important symptoms/effects - acute and delayed	: Eye disease. Skin disorders and Allergies. Asthma.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	: The product itself does not burn. For smaller fires, use dry chemical or carbon dioxide, do not use water. For large fires, flood fire area with water from as far as possible, using a protective barrier and appropriate personal protective equipment. Carbon dioxide (CO ₂). Dry chemical. Dry sand. Limestone powder.
Extinguishing media which must not be used for safety reasons.	: Water. Alcohol-resistant foam.
Specific hazards	: Downwind personnel must be evacuated. This product is not flammable, but it is an oxidizing material and can increase risk of fire or the intensity of a fire. Danger of explosion on contact with flammable liquids and other organic materials. Decomposes in contact with water.
Special protective equipment for fire-fighters	: Avoid contact with the skin. A face shield should be worn. Use personal protective equipment. Wear self contained breathing apparatus for fire fighting if necessary.
Further information	: The product, as distributed, is noncombustible., Do not allow run-off from fire fighting to enter drains or water courses., Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.,

Safety Data Sheet

Version 3.0
Revision Date 01/21/2015

SDS Number 300000030858
Print Date 09/06/2015

Immediately cool containers with water spray from maximum distance.

6. ACCIDENTAL RELEASE MEASURES

- | | |
|--|---|
| Personal Precautions, Protective Equipment, and Emergency Procedures | : Wear suitable protective clothing, gloves and eye/face protection. Use self-contained breathing apparatus and chemically protective clothing. Contact with combustible material may cause fire. Evacuate personnel to safe areas. |
| Environmental precautions | : Construct a dike to prevent spreading. |
| Methods for cleaning up | : Contact Air Products' Emergency Response Center for advice. Approach suspected leak areas with caution. Place in appropriate chemical waste container. |
| Additional advice | : Never return spills in original containers for re-use. Protect from water. Evacuate area and do not approach spilled product. If possible, stop flow of product. |

7. HANDLING AND STORAGE

Handling

Avoid contact with skin and eyes. Emergency showers and eye wash stations should be readily accessible. Adhere to work practice rules established by government regulations. Contact with combustible material may cause fire. Prevent contamination by any source during handling or storage. This product should be kept in its original container until time of use to avoid any contamination. Never return unused product to its original storage container. All equipment that may contact this product should be cleaned thoroughly to avoid potential reactions with organic contaminants. Empty containers may contain residual liquid or vapors; therefore, empty containers should be handled with care. Dispose of in accordance with local regulations. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented. Ensure the complete gas system is compatible for pressure rating and materials of construction. Ensure the complete gas system has been checked for leaks before use. To facilitate product removal, cylinder may be heated under controlled conditions to a temperature of 60°C (140°F). Open valve slowly. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Close container valve after each use and when empty, even if still connected to equipment. Do not smoke while handling product or cylinders. Never re-compress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. When returning cylinder install valve outlet cap or plug leak tight. Never permit oil, grease, or other readily combustible substances to come into contact with valves or containers containing oxygen or other oxidants. Use personal protective equipment. When using, do not eat, drink or smoke.

Storage

Keep away from organic materials. Keep away from combustible material. Keep in a well-ventilated place. Store in an area suitable for water reactive materials. Minimize exposure to air. Exposure may cause material to degrade. Store under a nitrogen atmosphere. Keep containers tightly closed in a cool, well-ventilated place. Full containers should be stored so that oldest stock is used first. Stored containers should be periodically checked

Safety Data Sheet

Version 3.0

Revision Date 01/21/2015

SDS Number 300000030858

Print Date 09/06/2015

for general condition and leakage. Observe all regulations and local requirements regarding storage of containers. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Full and empty cylinders should be segregated. Display "No Smoking or Open Flames" signs in the storage areas. Return empty containers in a timely manner. Gas containers should be segregated in the storage area according to the various categories (e.g., flammable, toxic, etc.).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures

Provide readily accessible eye wash stations and safety showers.

Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits.

Personal protective equipment

Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection : Impervious gloves.
Sturdy work gloves are recommended for handling cylinders.
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.

Eye protection : Full face shield with goggles underneath.
Safety glasses recommended when handling cylinders.

Skin and body protection : Impervious clothing.
Full rubber suit (rain gear).
Rubber or plastic boots.
Safety shoes are recommended when handling cylinders.
Slicker Suit.

Special instructions for protection and hygiene : Wash hands at the end of each workshift and before eating, smoking or using the toilet. Provide readily accessible eye wash stations and safety showers.

Exposure limit(s)

Safety Data Sheet

Version 3.0

Revision Date 01/21/2015

SDS Number 300000030858

Print Date 09/06/2015

Xenon Difluoride	Time Weighted Average (TWA): ACGIH	-	2.5 mg/m3
Xenon Difluoride	Time Weighted Average (TWA): OSHA Z2	-	2.5 mg/m3
Xenon Difluoride	Permissible exposure limit: OSHA Z1	-	2.5 mg/m3
Xenon Difluoride	Recommended exposure limit (REL): NIOSH	-	2.5 mg/m3

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Crystalline solid. White.
Odor	: Odorless.
Odor threshold	: No data available.
pH	: Not applicable.
Melting point/range	: 507 °F (264 °C)
Boiling point/range	: No data available.
Flash point	: Not applicable.
Evaporation rate	: Not applicable.
Flammability (solid, gas)	: Refer to product classification in Section 2
Upper/lower explosion/flammability limit	: Not applicable.
Vapor pressure	: 3.76 mmHg at 68 °F (20 °C)
Water solubility	: 25 g/l Decomposes in contact with water.
Relative vapor density	: Not applicable.
Relative density	: 4.32
Partition coefficient (n-octanol/water)	: Not applicable.
Auto-ignition temperature	: No data available.
Decomposition temperature	: No data available.
Viscosity	: Not applicable.
Molecular Weight	: No data available.

Safety Data Sheet

Version 3.0

Revision Date 01/21/2015

SDS Number 300000030858

Print Date 09/06/2015

10. STABILITY AND REACTIVITY

Chemical Stability	: Stable under normal conditions.
Conditions to avoid	: Avoid oil, grease and all other combustible materials. Exposure to moisture.
Materials to avoid	: Flammable materials. Organic materials. Combustible material. Humid air. Water. Avoid oil, grease and all other combustible materials.
Hazardous decomposition products	: Hydrolysis products: Hydrogen fluoride.
Possibility of hazardous Reactions/Reactivity	: Decomposes in contact with water.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Likely routes of exposure

Effects on Eye	: Causes eye burns. May cause blindness.
Effects on Skin	: Causes skin burns. Potential for hydrogen fluoride formation exists, which may cause additional tissue destruction and possibly a systemic reaction that can be fatal.
Inhalation Effects	: Can cause severe eye, skin and respiratory tract burns. Industrial chemicals such as this material with acute aerosol toxicity values as shown in Section 11 would not be classified as toxic by inhalation according to US domestic and international transport regulations. Toxic by inhalation.
Ingestion Effects	: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach. May be fatal if swallowed. Toxic if swallowed.
Symptoms	: No data available.

Acute toxicity

Acute Oral Toxicity	: LD50 : 90 mg/kg Species : Mouse.
Inhalation	: No data is available on the product itself.
Acute Dermal Toxicity	: No data is available on the product itself.

Safety Data Sheet

Version 3.0

Revision Date 01/21/2015

SDS Number 300000030858

Print Date 09/06/2015

Skin corrosion/irritation : No data available.

Serious eye damage/eye irritation : No data available.

Sensitization. : No data available.

Chronic toxicity or effects from long term exposures

Carcinogenicity : No data available.

Reproductive toxicity : No data is available on the product itself.

Germ cell mutagenicity : No data is available on the product itself.

Specific target organ systemic toxicity (single exposure) : No data available.

Specific target organ systemic toxicity (repeated exposure) : No data available.

Aspiration hazard : No data available.

Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure

This product contains no listed carcinogens according to IARC, ACGIH, NTP and/or OSHA in concentrations of 0.1 percent or greater. Eye disease., Skin disorders and Allergies., Asthma.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Aquatic toxicity : No data is available on the product itself.

Toxicity to other organisms : No data available.

Persistence and degradability

Biodegradability : No data is available on the product itself.

Mobility : No data available.

Bioaccumulation : No data is available on the product itself.

Safety Data Sheet

Version 3.0

Revision Date 01/21/2015

SDS Number 300000030858

Print Date 09/06/2015

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products : Contact supplier if guidance is required.

Contaminated packaging : Dispose of container and unused contents in accordance with federal, state, and local requirements.

14. TRANSPORT INFORMATION

DOT

UN/ID No. : UN3085
Proper shipping name : Oxidizing solid, corrosive, n.o.s., (Xenon Difluoride)
Class or Division : 5.1
Packing group : II
Label(s) : 5.1 (8)
Marine Pollutant : No

IATA

UN/ID No. : UN3085
Proper shipping name : Oxidizing solid, corrosive, n.o.s., (Xenon Difluoride)
Class or Division : 5.1
Packing group : II
Label(s) : 5.1 (8)
Marine Pollutant : No

IMDG

UN/ID No. : UN3085
Proper shipping name : OXIDIZING SOLID, CORROSIVE, N.O.S., (Xenon Difluoride)
Class or Division : 5.1
Packing group : II
Label(s) : 5.1 (8)
Marine Pollutant : No

TDG

UN/ID No. : UN3085
Proper shipping name : OXIDIZING SOLID, CORROSIVE, N.O.S., (Xenon Difluoride)
Class or Division : 5.1
Packing group : II
Label(s) : 5.1 (8)
Marine Pollutant : No

Further Information

The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact an Air Products customer service

Safety Data Sheet

Version 3.0
Revision Date 01/21/2015

SDS Number 300000030858
Print Date 09/06/2015

representative.

15. REGULATORY INFORMATION

Toxic Substance Control Act (TSCA) 12(b) Component(s):

None.

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on EINECS inventory or polymer substance, monomers included on EINECS inventory or no longer polymer.
Canada	DSL	Not on Inventory.
Australia	AICS	Included on Inventory.
Japan	ENCS	Not on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Not on Inventory.
Philippines	PICCS	Included on Inventory.

EPA SARA Title III Section 312 (40 CFR 370) Hazard Classification
Fire Hazard. Acute Health Hazard

EPA SARA Title III Section 313 (40 CFR 372) Component(s) above 'de minimus' level
None.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)
This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

16. OTHER INFORMATION

NFPA Rating

Health : 3
Fire : 0
Instability : 2
Special : OX

HMIS Rating

Health : 3
Flammability : 0
Physical hazard : 2

Prepared by : Air Products and Chemicals, Inc. Global EH&S Product Safety Department

Telephone : 1-610-481-4911 Corporate

Safety Data Sheet

Version 3.0

Revision Date 01/21/2015

SDS Number 300000030858

Print Date 09/06/2015

1-800-345-3148 Chemicals Cust Serv
1-800-752-1597 Gases/Electronics Cust Serv

Preparation Date : 09/06/2015

For additional information, please visit our Product Stewardship web site at
<http://www.airproducts.com/productstewardship/>
