

Issue Date: 16-Mar-2023

Revision Date: 01-Jul-2024

Version 2

## 1. IDENTIFICATION

### Product identifier

**Product Name** Deuterium

### Other means of identification

**SDS #** EF-035

**Synonyms** Deuterium molecule; Diplogen; Hydrogen-D2; Hydrogen-2; D2.  
**UN/ID No** UN1957

### Recommended use of the chemical and restrictions on use

**Recommended Use** For industrial use.

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

#### **Supplier Address**

EFC Gases & Advanced Materials  
3266 Bergey Road  
Hatfield, PA 19440  
Email: [efcsafety@efcgases.com](mailto:efcsafety@efcgases.com)

### Emergency telephone number

**Company Phone Number** 215-443-9600  
**Emergency Telephone** INFOTRAC 1-352-323-3500 (International)  
1-800-535-5053 (North America)

## 2. HAZARDS IDENTIFICATION

**Appearance** Colorless gas

**Physical state** Gas

**Odor** Odorless

### Classification

Flammable gases	Category 1
Gases under pressure	Compressed gas

### Signal Word

**Danger**

### Hazard statements

Extremely flammable gas  
Contains gas under pressure; may explode if heated



### Precautionary Statements - Prevention

Keep away from heat/sparks/open flames/hot surfaces. — No smoking

**Precautionary Statements - Response**

LEAKING GAS FIRE: Do not extinguish, unless leak can be stopped safely  
Eliminate all ignition sources if safe to do so

**Precautionary Statements - Storage**

Protect from sunlight. Store in a well-ventilated place

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Synonyms** Deuterium molecule; Diplogen; Hydrogen-D2; Hydrogen-2; D2.

Chemical name	CAS No	Weight-%
Deuterium	7782-39-0	100

\*\*If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.\*\*

### 4. FIRST AID MEASURES

**Description of first aid measures**

<b>Eye Contact</b>	Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.
<b>Skin Contact</b>	If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.
<b>Inhalation</b>	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.
<b>Ingestion</b>	If a large amount is swallowed, get medical attention.

**Most important symptoms and effects, both acute and delayed**

**Symptoms** Frostbite, suffocation.

**Indication of any immediate medical attention and special treatment needed**

**Notes to Physician** For inhalation, consider oxygen.

### 5. FIRE-FIGHTING MEASURES

**Suitable Extinguishing Media**

Carbon dioxide (CO<sub>2</sub>). Dry chemical.

**Large Fire** Water spray or fog.

**Unsuitable Extinguishing Media** None known.

**Specific Hazards Arising from the Chemical**

Severe fire hazard. Gas/air mixtures are explosive. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion. Burns with invisible flame.

**Protective equipment and precautions for firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Do not get water directly on material. Reduce vapors with water spray. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures**

**Personal Precautions**                      Use personal protective equipment as required.

**Environmental precautions**

**Environmental precautions**            Avoid release to the environment. See Section 12 for additional Ecological Information.

**Methods and material for containment and cleaning up**

**Methods for Containment**              Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry.

**Methods for Clean-Up**                    Remove sources of ignition. Ventilate closed spaces before entering.

## 7. HANDLING AND STORAGE

**Precautions for safe handling**

**Advice on Safe Handling**                Keep away from heat/sparks/open flames/hot surfaces. — No smoking. Wash thoroughly after handling.

**Conditions for safe storage, including any incompatibilities**

**Storage Conditions**                      Store and handle in accordance with all current regulations and standards. Store in a well-ventilated place. Protect from sunlight. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

**Incompatible Materials**                 Halogens. Oxidizing materials.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Guidelines**

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies

**Appropriate engineering controls**

**Engineering Controls**                    Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Individual protection measures, such as personal protective equipment**

<b>Eye/Face Protection</b>	Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
<b>Skin and Body Protection</b>	For the gas: Wear appropriate chemical resistant gloves. For the liquid: Wear appropriate protective, cold insulating clothing. For the gas: wear appropriate chemical resistant clothing. For the liquid: wear appropriate protective, cold insulating clothing.
<b>Respiratory Protection</b>	Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. For Unknown Concentrations or Immediately Dangerous to Life or Health Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

**General Hygiene Considerations** Handle in accordance with good industrial hygiene and safety practice.

**9. PHYSICAL AND CHEMICAL PROPERTIES**
**Information on basic physical and chemical properties**

<b>Physical state</b>	Gas	<b>Odor</b>	Odorless
<b>Appearance</b>	Colorless gas	<b>Odor Threshold</b>	Not determined
<b>Color</b>	Colorless		
<b><u>Property</u></b>	<b><u>Values</u></b>	<b><u>Remarks • Method</u></b>	
<b>pH</b>	No data available		
<b>Melting point / freezing point</b>	-254 °C / -425.2 °F		
<b>Initial boiling point and boiling range</b>	-250 °C / -418 °F		
<b>Flash point</b>	No data available		
<b>Evaporation Rate</b>	Not determined		
<b>Flammability (Solid, Gas)</b>	Flammable gas		
<b>Flammability Limit in Air</b>			
<b>Upper flammability or explosive limits</b>	75%		
<b>Lower flammability or explosive limits</b>	5%		
<b>Vapor Pressure</b>	17.14 kPa		
<b>Vapor Density</b>	0.1	(Air=1)	
<b>Relative Density</b>	0.169 @-253C (-423.4F)		
<b>Water Solubility</b>	Slightly soluble		
<b>Solubility in other solvents</b>	Not determined		
<b>Partition Coefficient</b>	Not determined		
<b>Autoignition temperature</b>	585 °C / 1,085 °F		
<b>Decomposition temperature</b>	Not determined		
<b>Kinematic viscosity</b>	Not determined		
<b>Dynamic Viscosity</b>	Not determined		
<b>Explosive Properties</b>	Not determined		
<b>Oxidizing Properties</b>	Not determined		

## 10. STABILITY AND REACTIVITY

### Reactivity

Not reactive under normal conditions.

### Chemical stability

Stable under recommended storage conditions.

### Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous polymerization will not occur.

### Conditions to Avoid

Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat.

### Incompatible materials

Halogens. Oxidizing materials.

### Hazardous decomposition products

None known based on information supplied.

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

#### Product Information

**Eye Contact** Avoid contact with eyes.

**Skin Contact** Avoid contact with skin.

**Inhalation** Do not inhale.

**Ingestion** Do not ingest.

### Component Information

Not available

### Symptoms related to the physical, chemical and toxicological characteristics

**Symptoms** Please see section 4 of this SDS for symptoms.

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Carcinogenicity** Based on the information provided, this product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

### Numerical measures of toxicity

The following values are calculated based on chapter 3.1 of the GHS document Not determined.

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

**Persistence/Degradability**

Not determined.

**Bioaccumulation**

There is no data for this product.

**Mobility**

Not determined

**Other adverse effects**

Not determined

**13. DISPOSAL CONSIDERATIONS****Waste Treatment Methods**

<b>Disposal of Wastes</b>	Disposal should be in accordance with applicable regional, national and local laws and regulations.
<b>Contaminated Packaging</b>	Disposal should be in accordance with applicable regional, national and local laws and regulations.

**14. TRANSPORT INFORMATION**

**Note** Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

**DOT**

<b>UN/ID No</b>	UN1957
<b>Proper Shipping Name</b>	Deuterium, compressed
<b>Transport hazard class(es)</b>	2.1

**IATA**

<b>UN number or ID number</b>	UN1957
<b>Proper Shipping Name</b>	Deuterium, compressed
<b>Transport hazard class(es)</b>	2.1

**IMDG**

<b>UN number or ID number</b>	UN1957
<b>Proper Shipping Name</b>	Deuterium, compressed
<b>Transport hazard class(es)</b>	2.1

**15. REGULATORY INFORMATION****International Inventories**

Chemical name	TSCA	TSCA Inventory Status	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AiIC
Deuterium	X	ACTIVE	X	X		X	X	X	

**Legend:**

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

*PICCS - Philippines Inventory of Chemicals and Chemical Substances*

*AICS - Australian Inventory of Chemical Substances*

**US Federal Regulations**

**CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

**SARA 311/312 Hazard Categories**

<b>Acute health hazard</b>	Yes
<b>Chronic Health Hazard</b>	No
<b>Fire hazard</b>	Yes
<b>Sudden Release of Pressure Hazard</b>	Yes
<b>Reactive Hazard</b>	No

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

**CWA (Clean Water Act)**

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

**US State Regulations**

**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

**U.S. State Right-to-Know Regulations**

<b>Chemical name</b>	<b>New Jersey</b>	<b>Massachusetts</b>	<b>Pennsylvania</b>
Deuterium 7782-39-0	X		X

**16. OTHER INFORMATION**

<b><u>NFPA</u></b>	Health hazards 2	Flammability 4	Instability 0	Special hazards -
<b><u>HMIS</u></b>	Health hazards -	Flammability -	Physical hazards -	Personal Protection -

Issue Date: 16-Mar-2023  
 Revision Date: 01-Jul-2024  
 Revision Note: Regulatory review

**Disclaimer**

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. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet**