



DEUTERIUM (D, 99.8%) CHEMICAL PURITY

99.999%

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Issue date: 6/4/2013 Revision date: 12/14/2022 Supersedes: 7/29/2015 Version: 6.1

SECTION 1: Identification

1.1. Identification

Product form : Substance
Substance name : DEUTERIUM (D, 99.8%) CHEMICAL PURITY 99.999%
CAS-No. : 1333-74-0
Product code : DLM-408-HP
Formula : D2

1.2. Recommended use and restrictions on use

No additional information available

1.3. Supplier

Cambridge Isotope Laboratories, Inc.
50 Frontage Rd
01810
ANDOVER, MA, 01810
USA
T 1-800-322-1174
cilsales@isotope.com - www.isotope.com

1.4. Emergency telephone number

Emergency number : 1-703-741-5970
Chemtrec 1-800-424-9300 24 hours

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification

Flammable gases Category 1	H220	Extremely flammable gas
Gases under pressure Compressed gas	H280	Contains gas under pressure; may explode if heated
Full text of H statements : see section 16		

2.2. GHS Label elements, including precautionary statements

GHS US labeling

Hazard pictograms (GHS US) :



Signal word (GHS US) : Danger
Hazard statements (GHS US) : H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated
Precautionary statements (GHS US) : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. heat, hot surfaces, open flames, sparks
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.
P403 - Store in a well-ventilated place.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.

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2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%	GHS US classification
DEUTERIUM (D, 99.8%) CHEMICAL PURITY 99.999% (Main constituent)	CAS-No.: 1333-74-0	100	Flam. Gas 1, H220 Press. Gas (Comp.), H280

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general	: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
First-aid measures after inhalation	: If breathed in, move person to fresh air. If not breathing, give artificial respiration. Consult a physician.
First-aid measures after skin contact	: Wash off with soap and plenty of water. Consult a physician.
First-aid measures after eye contact	: Flush eyes with water as a precaution.
First-aid measures after ingestion	: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2. Most important symptoms and effects (acute and delayed)

Potential Adverse human health effects and symptoms	: This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.
Symptoms/effects after inhalation	: May be harmful if inhaled. May cause respiratory tract irritation.
Symptoms/effects after skin contact	: May be harmful if absorbed through skin. May cause skin irritation.
Symptoms/effects after eye contact	: May cause eye irritation.
Symptoms/effects after ingestion	: May be harmful if swallowed.

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water spray. Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO₂).

5.2. Specific hazards arising from the chemical

Fire hazard : Extremely flammable gas. Contains gas under pressure; may explode if heated.

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5.3. Special protective equipment and precautions for fire-fighters

- Firefighting instructions : Fight fire with normal precautions from a reasonable distance. Wear a self contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Wear recommended personal protective equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Emergency procedures : Avoid breathing vapors, mist or gas. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3. Methods and material for containment and cleaning up

- For containment : Clean up any spills as soon as possible, using an absorbent material to collect it. Small quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal. For large spills, confine the spill in a dike and charge it with wet sand or earth for subsequent safe disposal.
- Methods for cleaning up : This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Additional hazards when processed : Normal measures for preventive fire protection.
- Precautions for safe handling : Avoid breathing dust, mist or spray. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take precautionary measures against static discharge.
- Hygiene measures : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Keep container tightly closed in a dry and well-ventilated place.
- Storage conditions : Store at room temperature away from light and moisture.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

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USA - ACGIH - Occupational Exposure Limits

Local name	Hydrogen
Remark (ACGIH)	TLV® Basis: Simple Asphyxiant
ACGIH chemical category	No component of this product present at levels greater than or equal to 0.1% is identifiable as a carcinogen or potential carcinogen by ACGIH.
Regulatory reference	ACGIH 2022

8.2. Appropriate engineering controls

Environmental exposure controls : Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.

Materials for protective clothing:

Wear suitable protective clothing and gloves

Hand protection:

Wear suitable protective clothing and gloves

Eye protection:

Wear safety glasses with side shields (or goggles) and a face shield.

Skin and body protection:

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection:

When appropriate, use NIOSH/CEN approved respirator.

Personal protective equipment symbol(s):



SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Compressed Gas.
Color	: Colorless
Odor	: No data available
Odor threshold	: No data available
pH	: No data available
Melting point	: -259.2 °C (-434.6 °F) - lit
Freezing point	: No data available
Boiling point	: -252.8 °C (-423.0 °F) - lit
Flash point	: < -150 °C (< -238 °F) - closed cup
Relative evaporation rate (butyl acetate=1)	: No data available

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Flammability (solid, gas)	: No data available
Vapor pressure	: No data available
Relative vapor density at 20°C	: 0.08
Relative density	: No data available
Molecular mass	: 4.03 g/mol (Labeled)
Solubility	: Water: 0.00196 g/l
Partition coefficient n-octanol/water (Log Pow)	: No data available
Auto-ignition temperature	: 571 °C (1,060 °F)
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosion limits	: 4 – 74.2 % (V)
Explosive properties	: No data available
Oxidizing properties	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable if stored under recommended conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Heat, flames and sparks.

10.5. Incompatible materials

Oxidizing agents.

10.6. Hazardous decomposition products

Formed under fire conditions - Nature of decomposition products not known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified
Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified

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STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified
Viscosity, kinematic	: No data available
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Symptoms/effects after skin contact	: May be harmful if absorbed through skin. May cause skin irritation.
Symptoms/effects after eye contact	: May cause eye irritation.
Symptoms/effects after ingestion	: May be harmful if swallowed.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.
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12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Regional legislation (waste)	: Waste materials should be disposed of under conditions which meet Federal, State, and local environmental control regulations.
Product/Packaging disposal recommendations	: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.
Ecology - waste materials	: Dispose of as unused product.

SECTION 14: Transport information

In accordance with DOT / TDG / IMDG / IATA

14.1. UN number

DOT NA No	: UN1957
UN-No. (TDG)	: UN1957
UN-No. (IMDG)	: 1957
UN-No. (IATA)	: 1957

14.2. UN proper shipping name

Proper Shipping Name (DOT)	: Deuterium, compressed
Proper Shipping Name (TDG)	: DEUTERIUM, COMPRESSED

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Proper Shipping Name (IMDG) : DEUTERIUM, COMPRESSED
Proper Shipping Name (IATA) : Deuterium, compressed

14.3. Transport hazard class(es)

DOT

Transport hazard class(es) (DOT) : 2.1
Hazard labels (DOT) : 2.1



TDG

Transport hazard class(es) (TDG) : 2.1
Hazard labels (TDG) : 2.1



IMDG

Transport hazard class(es) (IMDG) : 2.1
Hazard labels (IMDG) : 2.1



IATA

Transport hazard class(es) (IATA) : 2.1
Hazard labels (IATA) : 2.1



14.4. Packing group

Packing group (DOT) : Not applicable
Packing group (TDG) : Not applicable
Packing group (IMDG) : Not applicable
Packing group (IATA) : Not applicable

14.5. Environmental hazards

Other information : No supplementary information available.

14.6. Special precautions for user

Special transport precautions : IATA Passenger: Not permitted for transport.

DOT

UN-No.(DOT) : UN1957
DOT Special Provisions (49 CFR 172.102) : N89 - When steel UN pressure receptacles are used, only those bearing the "H" mark are authorized.
DOT Packaging Exceptions (49 CFR 173.xxx) : 306

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DOT Packaging Non Bulk (49 CFR 173.xxx)	: 302
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 150 kg
DOT Vessel Stowage Location	: E - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded.
DOT Vessel Stowage Other	: 40 - Stow "clear of living quarters"

TDG

UN-No. (TDG)	: UN1957
TDG Special Provisions	: 38 - A person must not handle, offer for transport or transport these dangerous goods in a large means of containment if they are in direct contact with the large means of containment.
ERAP Index	: 3000
Explosive Limit and Limited Quantity Index	: 0.125 L
Excepted quantities (TDG)	: E1
Passenger Carrying Ship Index	: Forbidden
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	: Forbidden
Emergency Response Guide (ERG) Number	: 115

IMDG

Limited quantities (IMDG)	: 0
Excepted quantities (IMDG)	: E0
Packing instructions (IMDG)	: P200
EmS-No. (Fire)	: F-D - FIRE SCHEDULE Delta - FLAMMABLE GASES
EmS-No. (Spillage)	: S-U - SPILLAGE SCHEDULE Uniform - GASES (FLAMMABLE, TOXIC OR CORROSIVE)
Stowage category (IMDG)	: E
Stowage and handling (IMDG)	: SW2
Flash point (IMDG)	: '
Properties and observations (IMDG)	: Flammable, odourless gas. Much lighter than air (0.14).
MFAG-No	: 115

IATA

PCA Excepted quantities (IATA)	: E0
PCA Limited quantities (IATA)	: Forbidden
PCA limited quantity max net quantity (IATA)	: Forbidden
PCA packing instructions (IATA)	: Forbidden
PCA max net quantity (IATA)	: Forbidden
CAO packing instructions (IATA)	: 200
CAO max net quantity (IATA)	: 150kg
Special provision (IATA)	: A1
ERG code (IATA)	: 10L

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

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SARA Section 302 Threshold Planning Quantity (TPQ)	Not subject to reporting requirements of the United States SARA Section 302
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SARA Section 311/312 Hazard Classes	Fire hazard Sudden release of pressure hazard

Commercial status of components according to the United States Environmental Protection Agency's Toxic Substances Control Act (TSCA):

Name	CAS-No.	Listing	Commercial status	Flags
DEUTERIUM (D, 99.8%) CHEMICAL PURITY 99.999%	1333-74-0	Not present	-	

15.2. International regulations

CANADA

DEUTERIUM (D, 99.8%) CHEMICAL PURITY 99.999% (1333-74-0)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

No additional information available

National regulations

DEUTERIUM (D, 99.8%) CHEMICAL PURITY 99.999% (1333-74-0)
Listed on TECI (Thailand Existing Chemicals Inventory)

15.3. US State regulations

DEUTERIUM (D, 99.8%) CHEMICAL PURITY 99.999% (1333-74-0)	
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - New Jersey - Right to Know Hazardous Substance List

SECTION 16: Other information

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Other information : This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the corresponding unlabeled compound.

Full text of H-phrases	
H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated

Safety Data Sheet (SDS), USA

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