Gas No. 1, Argon and Hydrogen

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 20 October 2017 Revision date: 24 May 2019 Supersedes: 12 June 2018 Version: 1.2

SECTION 1: Identification

1.1. Identification

Product form : Mixture

Trade name : Gas No. 1, Argon and Hydrogen

1.2. Recommended use and restrictions on use

Use of the substance/mixture : Used for sintering, purging and inerting furnace

Restrictions on use : Not suitable for human consumption

1.3. Supplier

Desktop Metal
63 3rd Avenue
Burlington, MA 01803
T 978-224-1244
www.desktopmetal.com

1.4. Emergency telephone number

Emergency number : 978-224-1244 (Hours: 9:00 am to 5:00 pm Eastern time)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Simple Asphyxiant	May displace oxygen and cause rapid suffocation
Gases under pressure Compressed gas	Contains gas under pressure; may explode if heated
Hazard Not Otherwise Classified	Contact with the liquefied gas causes frostbite

2.2. GHS Label elements, including precautionary statements

GHS US labeling

Hazard pictograms (GHS US) :

Signal word (GHS US) : Warning

Hazard statements (GHS US) : Contains gas under pressure; may explode if heated
May displace oxygen and cause rapid suffocation
Contact with the liquefied gas causes frostbite

Precautionary statements (GHS US) : Protect from sunlight. Store in a well-ventilated place.

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

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS-US classification
Argon	(CAS-No.) 7440-37-1	96.9 - 99	Simple Asphy Press. Gas (Comp.), H280
Hydrogen	(CAS-No.) 1333-74-0	< 3.10	Simple Asphy Flam. Gas 1, H220 Press. Gas (Comp.), H280

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

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Allow affected person to breathe fresh air. Give artificial respiration if necessary. If unconscious, place in the recovery position and seek medical advice.

First-aid measures after skin contact : Not expected to present a significant skin hazard under anticipated conditions of normal use. May cause frostbite on contact with liquefied gas. On frostbite: rinse with plenty of water, do NOT remove clothes. Get medical advice/attention.

First-aid measures after eye contact : Not expected to present a significant eye contact hazard under anticipated conditions of normal use. May cause frostbite on contact with liquefied gas. Obtain medical attention if pain, blinking or redness persists.

First-aid measures after ingestion : Not expected to present a significant ingestion hazard under anticipated conditions of normal use. If you feel unwell, seek medical advice.

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

Symptoms/effects : Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/effects after inhalation : May displace oxygen and cause rapid suffocation.

Symptoms/effects after skin contact : May cause frostbite on contact with liquefied gas.

Symptoms/effects after eye contact : May cause frostbite on contact with liquefied gas. Direct contact with the liquefied gas may cause severe and possibly permanent eye injury due to frostbite from rapid liquid evaporation.

Symptoms/effects after ingestion : Ingestion is not considered a potential route of exposure.

4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media : Do not aim water directly at point where compressed gas is escaping, as the water may freeze.

5.2. Specific hazards arising from the chemical

Fire hazard : Not expected to be a fire/explosion hazard under normal conditions of use. Hazardous combustion products. None known.

Explosion hazard : Contains gas under pressure; may explode if heated.

Reactivity in case of fire : None known.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Do not aim water directly at point where compressed gas is escaping, as the water may freeze. Exercise caution when fighting any chemical fire.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Stop leak if safe to do so.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Ventilate area.

6.2. Environmental precautions

No special environmental precautions required.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Provide adequate ventilation. Stop leak if safe to do so. For further information refer to section 13.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For disposal of residues refer to section 13: "Disposal considerations".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Handle and open container with care. Provide adequate ventilation. Ensure that there is a suitable ventilation system. Do not handle in a confined space. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep only in the original container in a cool, well ventilated place away from : Incompatible materials. Keep container closed when not in use. Cylinders should be firmly secured to prevent falling or being knocked over. Cylinders must be protected from the environment, and preferably kept at room temperature. Cylinders should be stored in dry, well ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage. Full and empty cylinders should be segregated. Use a "first-on, first out" inventory system to prevent full containers from being stored for long periods of time.

Incompatible materials : Halogens. Strong oxidizing agents.

Storage temperature : < 50 °C

Storage area : Store in a well-ventilated place.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Hydrogen (1333-74-0)		
ACGIH	Local name	Hydrogen
ACGIH	Remark (ACGIH)	TLV® Basis: Simple Asphyxiant
ACGIH	Regulatory reference	ACGIH 2019

Argon (7440-37-1)		
ACGIH	Local name	Argon
ACGIH	Remark (ACGIH)	TLV® Basis: Simple Asphyxiant
ACGIH	Regulatory reference	ACGIH 2019

8.2. Appropriate engineering controls

Appropriate engineering controls : Provide adequate ventilation.

8.3. Individual protection measures/Personal protective equipment

Hand protection:

Use loose-fitting rubber or leather gloves.

Eye protection:

Safety glasses.

Respiratory protection:

Wear suitable respiratory equipment in case of insufficient ventilation. Use a properly fitted, air-purifying or air-fed respirator if necessary.

Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Clear.

Color : Colorless

Odor : Odorless

Odor threshold : Not applicable

pH : No data available

Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	Not applicable
Relative evaporation rate (butyl acetate=1)	:	Not applicable
Flammability (solid, gas)	:	Non flammable
Vapor pressure	:	No data available
Relative vapor density at 20 °C	:	No data available
Relative density	:	No data available
Solubility	:	Water: Not miscible
Log Pow	:	No data available
Auto-ignition temperature	:	Not self-igniting
Decomposition temperature	:	No data available
Viscosity, kinematic	:	Not applicable
Viscosity, dynamic	:	Not applicable
Explosion limits	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	Not applicable.

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under normal conditions of use.

10.2. Chemical stability

Stable under normal conditions of use.

10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur. Under fire conditions closed containers may rupture or explode.

10.4. Conditions to avoid

Direct sunlight. Do not manipulate the product in a confined space.

10.5. Incompatible materials

Halogens. Strong oxidizing agents.

10.6. Hazardous decomposition products

None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (dermal)	:	Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation)	:	Not classified (Based on available data, the classification criteria are not met)

Hydrogen (1333-74-0)	
LC50 inhalation rat (ppm)	> 15000 ppm/1h

Skin corrosion/irritation	:	Not classified (Based on available data, the classification criteria are not met)
Serious eye damage/irritation	:	Not classified (Based on available data, the classification criteria are not met)
Respiratory or skin sensitization	:	Not classified (Based on available data, the classification criteria are not met)
Germ cell mutagenicity	:	Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity	:	Not classified (Based on available data, the classification criteria are not met)
Reproductive toxicity	:	Not classified (Based on available data, the classification criteria are not met)
Specific target organ toxicity – single exposure	:	Not classified (Based on available data, the classification criteria are not met)
Specific target organ toxicity – repeated exposure	:	Not classified (Based on available data, the classification criteria are not met)

Aspiration hazard	:	Not classified (Based on available data, the classification criteria are not met)
Viscosity, kinematic	:	No data available
Symptoms/effects	:	Not expected to present a significant hazard under anticipated conditions of normal use.
Symptoms/effects after inhalation	:	May displace oxygen and cause rapid suffocation.
Symptoms/effects after skin contact	:	May cause frostbite on contact with liquefied gas.
Symptoms/effects after eye contact	:	May cause frostbite on contact with liquefied gas. Direct contact with the liquefied gas may cause severe and possibly permanent eye injury due to frostbite from rapid liquid evaporation.
Symptoms/effects after ingestion	:	Ingestion is not considered a potential route of exposure.
Other information	:	Likely routes of exposure: inhalation, skin and eye.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Ecological problems are not known or expected under normal use.

12.2. Persistence and degradability

Gas No. 1, Argon and Hydrogen	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

Gas No. 1, Argon and Hydrogen	
Bioaccumulative potential	Not established.

Hydrogen (1333-74-0)	
BCF fish 1	(no bioaccumulation expected)

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on global warming	:	No known effects from this product.
Other information	:	Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Disposal methods

Product/Packaging disposal recommendations	:	Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials	:	Avoid release to the environment.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description	:	UN1956 Compressed gas, n.o.s. (Argon, Hydrogen mixture), 2.2
UN-No.(DOT)	:	UN1956
Proper Shipping Name (DOT)	:	Compressed gas, n.o.s. (Argon, Hydrogen mixture)
Class (DOT)	:	2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115
Hazard labels (DOT)	:	2.2 - Non-flammable gas

DOT Packaging Non Bulk (49 CFR 173.xxx)	:	302;305
DOT Packaging Bulk (49 CFR 173.xxx)	:	314;315
DOT Symbols	:	G - Identifies PSN requiring a technical name
DOT Packaging Exceptions (49 CFR 173.xxx)	:	306;307

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	75 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	150 kg
DOT Vessel Stowage Location	:	A - The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel.
Emergency Response Guide (ERG) Number	:	126
Other information	:	No supplementary information available.

Transportation of Dangerous Goods

Transport document description	:	UN1956 COMPRESSED GAS, N.O.S. (ARGON, HYDROGEN MIXTURE), 2.2
UN-No. (TDG)	:	UN1956
Proper Shipping Name (Transportation of Dangerous Goods)	:	COMPRESSED GAS, N.O.S. (ARGON, HYDROGEN MIXTURE)
TDG Primary Hazard Classes	:	2.2 - Class 2.2 - Non-Flammable, Non-Toxic Gas.
TDG Special Provisions	:	16
Explosive Limit and Limited Quantity Index	:	0.125 L
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	:	75 L

Transport by sea

Transport document description (IMDG)	:	UN 1956 COMPRESSED GAS, N.O.S. (ARGON, HYDROGEN MIXTURE), 2.2
UN-No. (IMDG)	:	1956
Proper Shipping Name (IMDG)	:	COMPRESSED GAS, N.O.S. (ARGON, HYDROGEN MIXTURE)
Class (IMDG)	:	2 - Gases
Limited quantities (IMDG)	:	120 ml

Air transport

Transport document description (IATA)	:	UN 1956 Compressed gas, n.o.s. (Argon, Hydrogen mixture), 2.2
UN-No. (IATA)	:	1956
Proper Shipping Name (IATA)	:	Compressed gas, n.o.s. (Argon, Hydrogen mixture)
Class (IATA)	:	2

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

15.2. International regulations

CANADA

Hydrogen (1333-74-0)
Listed on the Canadian DSL (Domestic Substances List)

Argon (7440-37-1)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Hydrogen (1333-74-0)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Argon (7440-37-1)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Hydrogen (1333-74-0)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on the TCSI (Taiwan Chemical Substance Inventory)

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15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date : 24 May 2019

Full text of H-phrases:

H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated

Indication of changes:

Section	Changed item	Change	Comments
3	Composition/information on ingredients	Modified	

SDS US (GHS HazCom 2012)

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.