

**SECTION: 1. Product and company identification**

**1.1. Product identifier**

Product form : Substance  
 Substance name : Arsine  
 CAS-No. : 7784-42-1  
 Formula : AsH<sub>3</sub>  
 Other means of identification : Arsine Hydride; Arsenic Trihydride; Hydrogen Arsenide

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

Use of the substance/mixture : Industrial and professional use

**1.3. Details of the supplier of the safety data sheet**

Linde Inc.  
 10 Riverview Drive  
 Danbury, CT 06810-6268, USA  
 www.lindeus.com

Electronics gas products 1-800-932-0624 or 1-908-329-9700  
 Linde Inc. 1-844-44LINDE (1-844-445-4633)

For additional product information contact your local customer service.

**1.4. Emergency telephone number**

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24 hr/day 7 days/week  
 — Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887  
 (collect calls accepted, Contract 17729)

**SECTION 2: Hazard identification**

**2.1. Classification of the substance or mixture**

**GHS-US classification**

Flam. Gas 1 H220  
 Press. Gas (Liq.) H280  
 Acute Tox. 1 (Inhalation:gas) H330  
 Carc. 2 H351  
 STOT RE 2 H373  
 Aquatic Acute 1 H400  
 Aquatic Chronic 1 H410

**2.2. Label elements**

**GHS US labelling**

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  
 H330 - FATAL IF INHALED  
 H351 - SUSPECTED OF CAUSING CANCER.  
 H373 - MAY CAUSE DAMAGE TO ORGANS (BLOOD, LIVER, KIDNEYS, HEART) THROUGH PROLONGED OR REPEATED EXPOSURE  
 H410 - VERY TOXIC TO AQUATIC LIFE WITH LONG LASTING EFFECTS

# Arsine

## Safety Data Sheet LIND-P007

Legacy SDS ID: P-4565

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### Precautionary statements (GHS US)

- CGA-HG01 - MAY CAUSE FROSTBITE.
- CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR
- CGA-HG11 - SYMPTOMS MAY BE DELAYED
- P201 - Obtain special instructions before use.
- P202 - Do not handle until all safety precautions have been read and understood.
- P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P260 - Do not breathe gas
- P262 - Do not get in eyes, on skin, or on clothing.
- P271+P403 - Use and store only outdoors or in a well-ventilated place
- P273 - Avoid release to the environment.
- P280+P284 - Wear protective gloves/protective clothing/eye protection/respiratory protection and/or face protection
- P377 - LEAKING GAS FIRE: Do not extinguish, unless leak can be stopped safely.
- P381 - Eliminate all ignition sources if safe to do so.
- P391 - Collect spillage.
- P405 - Store locked up.
- P501 - Dispose of contents/container in accordance with container supplier/owner instructions
- CGA-PG05 - Use a back flow preventive device in the piping.
- CGA-PG10 - Use only with equipment rated for cylinder pressure.
- CGA-PG12 - Do not open valve until connected to equipment prepared for use.
- CGA-PG06 - Close valve after each use and when empty.
- CGA-PG18 - When returning cylinder, install leak tight valve outlet cap or plug.
- CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).
- P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P310 - Immediately call a POISON CENTER/doctor.
- P302, P336, P315 - IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.
- P308+P313 - IF EXPOSED OR CONCERNED: Get medical advice/attention.

### 2.3. Other hazards

Other hazards which do not result in classification : None.

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Name	Product identifier	%
Arsine (Main constituent)	(CAS-No.) 7784-42-1	100

### 3.2. Mixtures

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

- First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician. . SYMPTOMS MAY BE DELAYED. Consider any exposure as a potentially toxic dose.
- First-aid measures after skin contact : The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

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First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

#### 4.2. Most important symptoms and effects, both acute and delayed

No additional information available

#### 4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, Dry chemical, Water spray or fog.

#### 5.2. Special hazards arising from the substance or mixture

Fire hazard : **DANGER! Toxic, flammable liquefied gas** . Vapor forms explosive mixtures with air and oxidizing agents. If leaking gas catches fire, do not extinguish flames. Flammable and toxic vapors may spread from leak and could explode if reignited by sparks or flames. Vapors are heavier than air and may collect in low spots. Explosive atmospheres may linger. Before entering area, especially confined areas, check with an appropriate device.

#### 5.3. Advice for firefighters

Firefighting instructions : **DANGER! Toxic, flammable liquefied gas**

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Other information : Cylinders are **NOT** equipped with a pressure relief valve.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : **DANGER! Toxic, flammable liquefied gas** . Immediately evacuate all personnel from danger area. Do not approach area without self-contained breathing apparatus and protective clothing. If cylinders are leaking, reduce toxic vapors with water spray or fog. Reverse flow into cylinder may cause rupture. (See section 16.) Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area.

##### 6.1.1. For non-emergency personnel

No additional information available

##### 6.1.2. For emergency responders

No additional information available

#### 6.2. Environmental precautions

Try to stop release. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with container supplier/owner instructions.

#### 6.3. Methods and material for containment and cleaning up

No additional information available

#### 6.4. Reference to other sections

See also sections 8 and 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling

: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment.

Avoid exposing cylinders to direct sunlight and high ambient temperatures.

Do not breathe gas/vapour. Avoid all contact with skin, eyes, or clothing. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Wear leather safety gloves and safety shoes when handling cylinders. Protect containers from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

Safe use of the product

: Do not breathe gas/vapours. Use only with adequate ventilation or respiratory protection. Do not get liquid or vapor in eyes, on skin, or on clothing. Have safety showers and eyewash fountains immediately available.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions

: Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

**OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE:** When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

### 7.3. Specific end use(s)

None.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Arsine (7784-42-1)		
ACGIH	ACGIH OEL TWA	0.005 ppm
USA OSHA	OSHA PEL TWA	0.2 mg/m <sup>3</sup>
USA OSHA	OSHA PEL TWA	0.05 ppm
USA IDLH	IDLH	3 ppm

### 8.2. Exposure controls

Appropriate engineering controls

: Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. **MECHANICAL (GENERAL): Inadequate - Use only in a closed system.** Use explosion proof equipment and lighting.

Hand protection

: Hydrogenated Nitrile -Butadiene rubber (HNBR). Select hand protection in accordance with OSHA 29 CFR 1910.138.

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Eye protection	: Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.
Skin and body protection	: Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.
Respiratory protection	: When workplace conditions warrant respirator use, follow a respiratory protection program that meets or exceeds the requirements of the appropriate Health and Safety Regulations. Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA). An air-supplied respirator must be used while working with this product in confined spaces. The respiratory protection used must conform with OSHA rules as specified in 29 CFR 1910.134. Select per OSHA 29 CFR 1910.134 and ANSI Z88.2.
Thermal hazard protection	: Wear cold insulating gloves when transfilling or breaking transfer connections.
Other information	: Consider the use of flame resistant anti-static safety clothing. Wear safety shoes while handling containers.

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Physical state	: Gas
Molecular mass	: 78 g/mol
Colour	: Colourless.
Odour	: Garlic like. Poor warning properties at low concentrations.
Odour threshold	: No data available
pH	: Not applicable.
Relative evaporation rate (butylacetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable.
Melting point	: -117 °C (-178 °F)
Freezing point	: No data available
Boiling point	: -62.5 °C (-80.1 °F)
Flash point	: Not applicable.
Critical temperature	: 99.9 °C (211.8 °F)
Auto-ignition temperature	: No data available
Decomposition temperature	: 230 – 240 °C (446 - 464 °F)
Flammability	: 5.1 – 78 vol %
Vapour pressure	: 15.1 bar (219.7 psia)
Relative vapour density at 20°C	: No data available
Relative density	: 1.6
Density	: 3.23 kg/m <sup>3</sup> (0.20 lb/ft <sup>3</sup> ) (vapor density at 21.1°C (70°F) and 1 atm)
Relative gas density	: 2.7
Solubility	: Water: slight
Partition coefficient n-octanol/water (Log Pow)	: Not applicable.
Partition coefficient n-octanol/water (Log Kow)	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Explosive properties	: Forms explosive mixtures with air and oxidizing agents.
Oxidizing properties	: None.
Explosive limits	: No data available

#### 9.2. Other information

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Additional information : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

No additional information available

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

May occur.

#### 10.4. Conditions to avoid

Exposure to light or heat in the presence of moisture.

#### 10.5. Incompatible materials

Oxidizing agents. Nitric acid. Halogens. Potassium. Ammonia.

#### 10.6. Hazardous decomposition products

Arsenic and its oxides. Hydrogen.

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified  
 Acute toxicity (dermal) : Not classified  
 Acute toxicity (inhalation) : Inhalation:gas: FATAL IF INHALED.

Arsine ( f )7784-42-1	
LC50 Inhalation - Rat [ppm]	178 ppm/1h mouse
ATE US (gases)	89 ppmv/4h

Skin corrosion/irritation : Not classified  
 pH: Not applicable.  
 Serious eye damage/irritation : Not classified  
 pH: Not applicable.  
 Respiratory or skin sensitisation : Not classified  
 Germ cell mutagenicity : Not classified  
 Carcinogenicity : SUSPECTED OF CAUSING CANCER.  
 Reproductive toxicity : Not classified  
 STOT-single exposure : Not classified  
 STOT-repeated exposure : MAY CAUSE DAMAGE TO ORGANS (BLOOD, LIVER, KIDNEYS, HEART) THROUGH PROLONGED OR REPEATED EXPOSURE.  
 Aspiration hazard : Not applicable

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general : VERY TOXIC TO AQUATIC LIFE WITH LONG LASTING EFFECTS.

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### 12.2. Persistence and degradability

Arsine (7784-42-1)	
Persistence and degradability	Not applicable for inorganic products.

### 12.3. Bioaccumulative potential

Arsine (7784-42-1)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No data available.

### 12.4. Mobility in soil

Arsine (7784-42-1)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

### 12.5. Other adverse effects

Effect on the ozone layer : None.

Effect on global warming : No known effects from this product.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Product/Packaging disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

## SECTION 14: Transport information

In accordance with DOT

Transport document description (DOT) : UN2188 Arsine, 2.3

UN-No. (DOT) : UN2188

Proper Shipping Name (DOT) : Arsine

Transport hazard class(es) (DOT) : 2.3 (2.1)

Hazard labels (DOT) : Poison Gas  
2.3 - Poison gas  
2.1 - Flammable gas



DOT Special Provisions (49 CFR 172.102) : 1 - This material is poisonous by inhalation (see 171.8 of this subchapter) in Hazard Zone A (see 173.116(a) or 173.133(a) of this subchapter), and must be described as an inhalation hazard under the provisions of this subchapter.

### Additional information

Emergency Response Guide (ERG) Number : 119;173

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers:  
- Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

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### Transport by sea

UN-No. (IMDG) : 2188  
 Proper Shipping Name (IMDG) : ARSINE  
 Transport hazard class(es) (IMDG) : 2.3 (2.1)  
 Division (IMDG) : 2.3 - Toxic gases  
 EmS-No. (1) : F-D  
 EmS-No. (2) : S-U

Dangerous for the environment : Yes  
 Marine pollutant : Yes



Other information : No supplementary information available.

### Air transport

UN-No. (IATA) : 2188  
 Proper Shipping Name (IATA) : Arsine  
 Transport hazard class(es) (IATA) : 2.3 (2.1)

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Arsine (7784-42-1)

Listed on the United States SARA Section 302

Listed on the United States TSCA (Toxic Substances Control Act) inventory

SARA Section 302 Threshold Planning Quantity (TPQ)	100 lb
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### 15.2. International regulations

#### CANADA

#### Arsine (7784-42-1)

Listed on the Canadian DSL (Domestic Substances List)

#### EU-Regulations

#### Arsine (7784-42-1)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

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### 15.2.2. National regulations

#### Arsine (7784-42-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active  
 Listed on the Canadian IDL (Ingredient Disclosure List)  
 Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)  
 Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
 Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
 Listed on KECL/KECI (Korean Existing Chemicals Inventory)  
 Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
 Japanese Poisonous and Deleterious Substances Control Law  
 Japanese Pollutant Release and Transfer Register Law (PRTR Law)  
 Listed on NZIoC (New Zealand Inventory of Chemicals)  
 Listed on the Japanese ISHL (Industrial Safety and Health Law)  
 Listed on INSQ (Mexican National Inventory of Chemical Substances)  
 Listed on the TCSI (Taiwan Chemical Substance Inventory)  
 Listed on the NCI (Vietnam - National Chemical Inventory)

### 15.3. US State regulations

#### Arsine(7784-42-1)

U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Massachusetts - Right To Know List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

### SECTION 16: Other information

#### Other information

: When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Linde Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Inc, it is the user's obligation to determine the conditions of safe use of the product.

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SDS US (GHS HazCom 2012) - Linde 2022

*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.*