Safety Data Sheet



Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Synonyms P-10 (Nuclear Counter Mixture); P-10 Gas Mixture

Product Code | 15041

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

Relevant identified use(s) | Semiconductor Uses

1.3 Details of the supplier of the safety data sheet

Manufacturer | Air Liquide

2700 Post Oak Blvd. Houston, TX 77056 United States

www.us.airliquide.com sds@airliquide.com

Telephone (Technical) 713-896-2896 Telephone (Technical) 800-819-1704

1.4 Emergency telephone number

Manufacturer | 800-424-9300 - CHEMTREC

Manufacturer +1 703-527-3887 - Outside United States

Section 2: Hazards Identification

EU/EEC

According to Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010] According to EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP Compressed Gas - H280
DSD/DPD Classification criteria not met

2.2 Label Elements

CLP

WARNING



Hazard statements | H280 - Contains gas under pressure; may explode if heated

Precautionary statements

Storage/Disposal P403 - Store in a well-ventilated place.

DSD/DPD

Risk phrases | No label element(s) required

2.3 Other Hazards

CLP According to Regulation (EC) No. 1272/2008 (CLP) this material is considered

hazardous.

DSD/DPD This product is not considered dangerous under the European Directive 67/548/EEC

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012 Compressed Gas - H280

2.2 Label elements

OSHA HCS 2012

WARNING



Hazard statements | Contains gas under pressure; may explode if heated - H280

Precautionary statements

Storage/Disposal | Store in a well-ventilated place. - P403

2.3 Other hazards

OSHA HCS 2012 Under United States Regulations (29 CFR 1910.1200 - Hazard Communication

Standard), this product is considered hazardous.

Canada

According to WHMIS

2.1 Classification of the substance or mixture

WHMIS Compressed Gas - A

2.2 Label elements

WHMIS



Compressed Gas - A

2.3 Other hazards

WHMIS

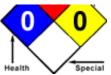
In Canada, the product mentioned above is considered hazardous under the

Workplace Hazardous Materials Information System (WHMIS).

2.4 Other information

NFPA





Note: This SDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 3(Composition/Information on Ingredients). All classifications provided are based on the highest end of the range provided for each component. Refer to the product label for information on the actual composition of the product.

Section 3 - Composition/Information on Ingredients

3.1 Substances

Material does not meet the criteria of a substance in accordance with Regulation (EC) No 1272/2008.

3.2 Mixtures

	Composition							
Chemical Name	Identifiers	%	LD50/LC50	Classifications According to Regulation/Directive				
Argon	CAS:7440-37-1 EC Number:231-147-0	Balance	NDA	EU DSD/DPD: Not Classified EU CLP: Self Classified - Press. Gas - Comp, H280 OSHA HCS 2012: Press. Gas - Comp.				
Methane	CAS:74-82-8 EC Number:200-812-7 EU Index:601-001-00-4	10%	NDA	EU DSD/DPD: Annex I - F+; R12 EU CLP: Annex VI - Flam. Gas 1, H220; Press. Gas, H280 OSHA HCS 2012: Flam. Gas 1; Press. Gas - Comp; Simp. Asphyx.				

See Section 16 for full text of H-statements and R-phrases.

Section 4 - First Aid Measures

4.1 Description of first aid measures

4.1 Description of first aid measures

First aid is not expected to be necessary if material is used under ordinary conditions

and as recommended.

Although exposure is unlikely, in case of contact immediately flush skin with running

water. If skin irritation develops get medical advice/attention.

First aid is not expected to be necessary if material is used under ordinary conditions

and as recommended. If irritation develops and persists, get medical attention.

Ingestion Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician

Inhalation

Skin

Eye

All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred. A potential health hazard associated with this gas is anoxia.

4.4 Other information

Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO GASES WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing

Apparatus must be worn. Victim(s) who experience any adverse effect after overexposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media | Use extinguishing agent suitable for type of surrounding fire.

Unsuitable Extinguishing

Media

No data available

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion

Hazards

Containers may explode when heated. Ruptured cylinders may rocket.

Hazardous Combustion Products

No data available

5.3 Advice for firefighters

Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is

Always wear thermal protective clothing when handling refrigerated/cryogenic liquids. Wear positive pressure self-contained breathing apparatus (SCBA).

Move containers from fire area if you can do it without risk.

FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.

FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out.

FIRE INVOLVING TANKS: Do not direct water at source of leak or safety devices;

icing may occur.

FIRE INVOLVING TANKS: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

FIRE INVOLVING TANKS: ALWAYS stay away from tanks engulfed in fire.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions

Ventilate the area before entry. Do not walk through spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Emergency Procedures

Keep unauthorized personnel away. Keep out of low areas. Stay upwind. Do not direct water at spill or source of leak. LARGE SPILL: Consider initial downwind evacuation for at least 500 meters (1/3 mile)

6.2 Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

Stop leak if you can do it without risk.

Do not direct water at spill or source of leak.

Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.

If possible, turn leaking containers so that gas escapes rather than liquid. Isolate area until gas has dispersed.

6.4 Reference to other sections

Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling

Use only with adequate ventilation. Ventilate closed spaces before entering. Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Wear appropriate personal protective equipment, avoid direct contact. Cylinders should be firmly secured to prevent falling or being knocked-over. Do not attempt to repair, adjust, or in any other way modify cylinders. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container.

7.2 Conditions for safe storage, including any incompatibilities

Storage

Store in a cool, dry, well-ventilated place. Protect cylinders against physical damage. Cylinders should be firmly secured to prevent falling or being knocked-over.

7.3 Specific end use(s)

Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

	Exposure Limits/Guidelines								
	Result	ACGIH	Canada Ontario	Ireland	Israel	Portugal			
Methane (74-82-8)	TWAs	1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)	1000 ppm TWA	1000 ppm TWA	1000 ppm TWA (gas, listed under Aliphatic hydrocarbon gases: Alkane C1-4)	1000 ppm TWA [VLE- MP]			
		Ex	posure Limits/Gu	idelines (Con't.)					
			Result	Spain					
Methane (74-82-8)			TWAs	1000 ppm TWA ED]	[VLA-				

Exposure Control Notations

Portugal

•Argon (7440-37-1): Simple Asphyxiants: (Simple Asphyxiant)

Ireland

Argon (7440-37-1): Simple Asphyxiants: (Asphyxiant)
 Methane (74-82-8): Simple Asphyxiants: (Asphyxiant)

Spain

•Argon (7440-37-1): Simple Asphyxiants: (simple asphyxiant)

8.2 Exposure controls

Engineering Measures/Controls

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory

In case of insufficient ventilation, wear suitable respiratory equipment. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149.

Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face Skin/Body Wear safety glasses.

Wear leather gloves when handling cylinders.

Environmental Exposure Controls

Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Gas	Appearance/Description	Colorless compressed gas with no odor.
Color	Colorless	Odor	Odorless
Odor Threshold	None		
General Properties		•	
Boiling Point	-185.9 C(-302.62 F) Argon	Melting Point	-189.2 C(-308.56 F) Argon
Decomposition Temperature	Data lacking	pН	Not relevant
Specific Gravity/Relative Density	Data lacking	Density	0.103 lb(s)/ft³ @ 21.1 C(69.98 F) Argon
Water Solubility	0.056 % @ 0 C(32 F) Argon	Viscosity	Data lacking
Explosive Properties	Data lacking	Oxidizing Properties:	Data lacking
Volatility		•	
Vapor Pressure	Not relevant	Vapor Density	1.38 Air=1 Argon
Evaporation Rate	Not relevant		
Flammability			•
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	Data lacking
Flammability (solid, gas)	Flammable gas.		
Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4 Conditions to avoid

Excess heat.

10.5 Incompatible materials

Halogens, oxidizing materials, combustible materials.

10.6 Hazardous decomposition products

Oxides of carbon.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

GHS Properties	Classification
Acute toxicity	EU/CLP ◆ Classification criteria not met OSHA HCS 2012 ◆ Classification criteria not met
Aspiration Hazard	EU/CLP Classification criteria not met OSHA HCS 2012 Classification criteria not met
Carcinogenicity	EU/CLP Classification criteria not met OSHA HCS 2012 Classification criteria not met
Germ Cell Mutagenicity	EU/CLP Classification criteria not met OSHA HCS 2012 Classification criteria not met
Skin corrosion/Irritation	EU/CLP Classification criteria not met OSHA HCS 2012 Classification criteria not met
Skin sensitization	EU/CLP Classification criteria not met OSHA HCS 2012 Classification criteria not met
STOT-RE	EU/CLP Classification criteria not met OSHA HCS 2012 Classification criteria not met
STOT-SE	EU/CLP ◆ Classification criteria not met OSHA HCS 2012 ◆ Classification criteria not met
Toxicity for Reproduction	EU/CLP Classification criteria not met OSHA HCS 2012 Classification criteria not met
Respiratory sensitization	EU/CLP ◆ Classification criteria not met OSHA HCS 2012 ◆ Classification criteria not met
Serious eye damage/Irritation	EU/CLP ◆ Classification criteria not met OSHA HCS 2012 ◆ Classification criteria not met

Potential Health Effects

Inhalation

Acute (Immediate) I Under normal conditions of use, no health effects are expected.

Chronic (Delayed) | No data available

Skin

Acute (Immediate)

Under normal conditions of use, no health effects are expected.

Chronic (Delayed)

Under normal conditions of use, no health effects are expected.

Eye

Acute (Immediate) I Under normal conditions of use, no health effects are expected.

Chronic (Delayed)Under normal conditions of use, no health effects are expected.

Ingestion

Acute (Immediate)Ingestion is not anticipated to be a likely route of exposure to this product.

Chronic (Delayed)Ingestion is not anticipated to be a likely route of exposure to this product.

Section 12 - Ecological Information

12.1 Toxicity

Material data lacking.

12.2 Persistence and degradability

Material data lacking.

12.3 Bioaccumulative potential

Material data lacking.

12.4 Mobility in Soil

Material data lacking.

12.5 Results of PBT and vPvB assessment

PBT and vPvB assessment has not been conducted for this material.

12.6 Other adverse effects

No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product wasteDispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste

| Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN1956	Compressed gas, n.o.s. (Methane, Argon)	2.2	NDA	NDA
TDG	UN1956	COMPRESSED GAS N.O.S. (Methane, Argon)	2.2	NDA	NDA
IMO/IMDG	UN1956	COMPRESSED GAS, N.O.S. (Methane, Argon)	2.2	NDA	NDA
IATA/ICAO	UN1956	COMPRESSED GAS, N.O.S. (Methane, Argon)	2.2	NDA	NDA

14.6 Special precautions for Cylinders should be transported in a secure position, in a well-ventilated vehicle. The

user

transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

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

Not relevant.

Section 15 - Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications | Pressure(Sudden Release of), Acute

State Right To Know						
Component	CAS	MA	NJ	PA		
Argon	7440-37-1	Yes	Yes	Yes		
Methane	74-82-8	Yes	Yes	Yes		

Inventory							
Component	CAS	Canada DSL	Canada NDSL	China	EU EINECS	EU ELNICS	
Argon	7440-37-1	Yes	No	Yes	Yes	No	
Methane	74-82-8	Yes	No	Yes	Yes	No	
			Inventory (Co	n't.)			
Component			CAS	TS	CA		
Argon		7	440-37-1	Y	es		
Methane		7	4-82-8	Y	es		

Canada

bor Canada - WHMIS - Classifications of Substances		
• Argon	7440-37-1	A
Methane	74-82-8	A, B1
Canada - WHMIS - Ingredient Disclosure List		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed

Environment

Canada - CEPA - Priority Substances List

Argon
 Methane
 7440-37-1
 Not Listed
 Not Listed

China

Environment

China - Ozone Depleting Substances - First Schedule

Argon
 Methane
 7440-37-1
 Not Listed
 Not Listed

• Argon	7440-37-1 Not Listed	
Methane	74-82-8 Not Listed	
China - Ozone Depleting Substances - Third Schedule		
China - Ozone Depleting Substances - Third Schedule • Argon	7440-37-1 Not Listed	

Other		
China - Annex I & II - Controlled Chemicals Lists		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
China - Dangerous Goods List		
• Argon	7440-37-1	(compressed or refrigerated liquid)
Methane	74-82-8	(compressed or refrigerated liquid)
China - Export Control List - Part I Chemicals		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed

Europe

Argon	7440-37-1	Not Listed
Methane	74-82-8	F+; R12
:U - CLP (1272/2008) - Annex VI - Table 3.2 - Concentra	ation Limits	
Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	F+ R:12 S:(2)-9-16-33
EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Su	bstances and Preparations	
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Ph	rases	
• Argon	7440-37-1	Not Listed
Methane	74-82-8	S:(2)-9-16-33

Germany

Environment Germany - TA Luft - Types and Classes		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
Germany - Water Classification (VwVwS) - Annex 1		
		ID Number 1348, not
• Argon	7440-37-1	considered hazardous to

Methane	74-82-8	water ID Number 1343, not considered hazardous to water
Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Class		Not Listed
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
Germany - Water Classification (VwVwS) - Annex 3		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
Other		
Germany - Specifically Regulated Chemicals in TRGS		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
ortugal		
Other		
Portugal - Prohibited Substances		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
Inited Kingdom		
Environment United Kingdom - Pollution Inventory - Schedule 1 - Thresholds for Release	ases to Air	
• Argon	7440-37-1	Not Listed
Methane	74-82-8	10000 kg
Other		
United Kingdom - Workplace Exposure Limits (WELs) - Substances in Re		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
United Kingdom - List of Dangerous Substances in Water		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
nited States		
Labor U.S OSHA - Process Safety Management - Highly Hazardous Chemicals	s	
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
U.S OSHA - Specifically Regulated Chemicals		
Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
Environment		
Environment U.S CAA (Clean Air Act) - 1990 Hazardous Air Pollutants		
Argon	7440-37-1	Not Listed

Methane	74-82-8	Not Listed
U.S CERCLA/SARA - Hazardous Substances and their Reportable Quantities	7440 07 4	Next liese d
ArgonMethane	7440-37-1 74-82-8	Not Listed Not Listed
U.C. CEDCLA/CADA Dedicaryolidae and Their Demortable Overtities		
U.S CERCLA/SARA - Radionuclides and Their Reportable Quantities • Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
U.S CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
U.S CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
U.S CERCLA/SARA - Section 313 - Emission Reporting		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
U.S CERCLA/SARA - Section 313 - PBT Chemical Listing		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed

United States - California

Environment U.S California - Proposition 65 - Carcinogens List		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
U.S California - Proposition 65 - Developmental Toxicity		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
U.S California - Proposition 65 - Maximum Allowable Dose Levels (MADL)		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
U.S California - Proposition 65 - No Significant Risk Levels (NSRL)		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
U.S California - Proposition 65 - Reproductive Toxicity - Female		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed
U.S California - Proposition 65 - Reproductive Toxicity - Male		
• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed

United States - Pennsylvania

Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

• Argon	7440-37-1	Not Listed
Methane	74-82-8	Not Listed

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Relevant Phrases (code & full text)

H220 - Extremely flammable gas

R12 - Extremely flammable.

Last Revision Date

22/December/2014

Preparation Date

22/December/2014

Disclaimer/Statement of Liability

To the best of Air Liquide's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this gas mixture is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

Key to abbreviations NDA = No Data Available