Safety Data Sheet

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

1.1 Product identifier

Product Name • **C1-C6 N-Paraffins in Helium**

Product Code • M-219/E-1

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

Relevant identified use(s) • Test Gas/Calibration Gas

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 • Not classified - 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
- This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
  According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD
- This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
  According to European Directive 1999/45/EC this preparation is not considered dangerous.

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
  Simple Asphyxiant

2.2 Label elements

OSHA HCS 2012

WARNING

Hazard statements
- Contains gas under pressure; may explode if heated - H280
  May displace oxygen and cause rapid suffocation.

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
- This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
  In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

2.4 Other information

NFPA

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**	**Comments**
Butane	**CAS:**106-97-8 **EC Number:**203-448-7 **EU Index:**601-004-00-0	0.01%	Inhalation-Rat LC50 • 658 g/m³ 4 Hour(s)	**EU DSD/DPD:** Annex I: F+; R12 **EU CLP:** Annex VI: Flam. Gas 1, H220; Press. Gas - Comp., H280 **OSHA HCS 2012:** Flam. Gas 1; Press. Gas - Comp.	NDA
Ethane	**CAS:**74-84-0 **EC Number:**200-814-8 **EU Index:**601-002-00-X	0.01%	NDA	**EU DSD/DPD:** Annex I: F+; R12 **EU CLP:** Annex VI: Flam. Gas 1, H220; Press. Gas - Comp., H280 **OSHA HCS 2012:** Flam. Gas 1; Press. Gas - Comp.; Simp. Asphxy.	NDA
Hexane	**CAS:**110-54-3 **EC Number:**203-777-6 **EU Index:**601-037-00-0	0.01%	Ingestion/Oral-Rat LD50 • 25 g/kg Inhalation-Rat LC50 • 627000 mg/m³ 3 Minute(s)	**EU DSD/DPD:** Annex I: F; R11 Xi; R38 N; R51-53 Repr.Cat.3; R62 Xn; R65-48/20 R67 **EU CLP:** Annex VI: Flam. Liq. 2, H225; Repr. 2, H361f; Asp. Tox. 1, H304; STOT RE 2, H373; Skin Irrit. 2, H315; STOT SE 3, H336; Aquatic Chronic 2, H411 **OSHA HCS 2012:** Flam. Liq. 2; Repr. 2; STOT RE 2 (CNS, Nervous System); Skin Irrit. 2; Eye Irrit. 2B; STOT SE 3: Narc. & Resp. Irrit.; Asp. Tox. 1	NDA
Methane	**CAS:**74-82-8 **EC Number:**200-812-7 **EU Index:**601-001-00-4	0.01%	NDA	**EU DSD/DPD:** Annex I: F+; R12 **EU CLP:** Annex VI: Flam. Gas 1, H220; Press. Gas - Comp., H280 **OSHA HCS 2012:** Flam. Gas 1; Press. Gas - Comp.; Simp. Asphxy.	NDA
Pentane	**CAS:**109-66-0 **EC Number:**203-692-4 **EU Index:**601-006-00-1	0.01%	Inhalation-Rat LC50 • 364 g/m³ 4 Hour(s) Ingestion/Oral-Rat LD50 • >2000 mg/kg	**EU DSD/DPD:** Annex I: F+; R12 N; R51-53 Xn; R65 R66 R67 **EU CLP:** Annex VI: Flam. Liq. 2, H225; Asp. Tox. 1, H304; STOT SE 3, H336; Aquatic Chronic 2, H411; EUH066 **OSHA HCS 2012:** Flam. Liq. 1; Asp. Tox. 1;Eye Irrit. 2A; Skin Irrit. 2; STOT SE 3: Narc.	NDA

Propane	**CAS:**74-98-6 **EC Number:**200-827-9 **EU Index:**601-003-00-5	0.01%	NDA	**EU DSD/DPD:** Annex I: F+; R12 **EU CLP:** Annex VI: Flam. Gas 1, H220; Press. Gas - Comp., H280 **OSHA HCS 2012:** Flam. Gas 1; Press. Gas - Comp.; Simp. Asphxy.	NDA
Helium	**CAS:**7440-59-7 **EINECS:**231-168-5	99.94%	NDA	**EU DSD/DPD:** Not Classified **EU CLP:** Self Classified: Press. Gas - Comp, H280 **OSHA HCS 2012:** Press. Gas - Comp.; Simp. Asphyx.	NDA

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

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. If signs/symptoms continue, get medical attention.

Skin
- Although exposure is unlikely, in case of contact immediately flush skin with running water. If skin irritation develops get medical advice/attention.

Eye
- 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
- 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 over-exposure 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 possible.
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

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

Emergency Procedures

- Stop leak if you can do it without risk. 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 spreading of vapors through sewers, ventilation systems and 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.
Ventilate the area.

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**	**Canada Quebec**	**China**	**Europe**
Pentane (109-66-0)	TWAs	600 ppm TWA (listed under Pentane, all isomers)	600 ppm TWA	120 ppm TWAEV; 350 mg/m3 TWAEV	500 mg/m3 TWA (listed under Pentane (all isomers))	1000 ppm TWA; 3000 mg/m3 TWA
	STELs	Not established	Not established	Not established	1000 mg/m3 STEL (listed under Pentane (all isomers))	Not established
Hexane (110-54-3)	TWAs	50 ppm TWA	50 ppm TWA	50 ppm TWAEV; 176 mg/m3 TWAEV	100 mg/m3 TWA	20 ppm TWA; 72 mg/m3 TWA
	STELs	Not established	Not established	Not established	180 mg/m3 STEL	Not established
Ethane (74-84-0)	TWAs	1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)	1000 ppm TWA	Not established	Not established	Not established
Propane (74-98-6)	TWAs	1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)	1000 ppm TWA	1000 ppm TWAEV; 1800 mg/m3 TWAEV	Not established	Not established
Methane (74-82-8)	TWAs	1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)	1000 ppm TWA	Not established	Not established	Not established
Butane (106-97-8)	TWAs	Not established	800 ppm TWA (listed under Aliphatic hydrocarbon gases)	800 ppm TWAEV; 1900 mg/m3 TWAEV	Not established	Not established
	STELs	1000 ppm STEL	Not established	Not established	Not established	Not established

Exposure Limits/Guidelines (Con't.)						
	Result	**France**	**Germany DFG**	**Germany TRGS**	**Ireland**	**Israel**
Pentane (109-66-0)	TWAs	1000 ppm TWA [VME] (restrictive limit); 3000 mg/m3 TWA [VME] (restrictive limit)	Not established	1000 ppm TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, exposure factor 2); 3000 mg/m3 TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, exposure factor 2)	1000 ppm TWA; 3000 mg/m3 TWA	600 ppm TWA (listed under Pentane, all isomers)

	STELs	Not established	Not established	Not established	750 ppm STEL; 2250 mg/m3 STEL	Not established
	Ceilings	Not established	2000 ppm Peak (listed under Pentane); 6000 mg/m3 Peak (listed under Pentane)	Not established	Not established	Not established
	MAKs	Not established	1000 ppm TWA MAK; 3000 mg/m3 TWA MAK	Not established	Not established	Not established
Hexane (110-54-3)	TWAs	20 ppm TWA [VME] (restrictive limit); 72 mg/m3 TWA [VME] (restrictive limit)	Not established	50 ppm TWA AGW (exposure factor 8); 180 mg/m3 TWA AGW (exposure factor 8)	20 ppm TWA; 72 mg/m3 TWA	50 ppm TWA
	Ceilings	Not established	400 ppm Peak; 1440 mg/m3 Peak	Not established	Not established	Not established
	MAKs	Not established	50 ppm TWA MAK; 180 mg/m3 TWA MAK	Not established	Not established	Not established
Ethane (74-84-0)	TWAs	Not established	Not established	Not established	1000 ppm TWA	1000 ppm TWA (gas)
Propane (74-98-6)	TWAs	Not established	Not established	1000 ppm TWA AGW (exposure factor 4); 1800 mg/m3 TWA AGW (exposure factor 4)	1000 ppm TWA	1000 ppm TWA (gas)
	Ceilings	Not established	4000 ppm Peak; 7200 mg/m3 Peak	Not established	Not established	Not established
	MAKs	Not established	1000 ppm TWA MAK; 1800 mg/m3 TWA MAK	Not established	Not established	Not established
Methane (74-82-8)	TWAs	Not established	Not established	Not established	1000 ppm TWA	1000 ppm TWA (gas, listed under Aliphatic hydrocarbon gases: Alkane C1-4)
Butane (106-97-8)	TWAs	800 ppm TWA [VME]; 1900 mg/m3 TWA [VME]	Not established	1000 ppm TWA AGW (exposure factor 4); 2400 mg/m3 TWA AGW (exposure factor 4)	1000 ppm TWA	Not established
	STELs	Not established	Not established	Not established	Not established	1000 ppm STEL
	Ceilings	Not established	4000 ppm Peak (listed under Butane); 9600 mg/m3 Peak (listed under Butane)	Not established	Not established	Not established
	MAKs	Not established	1000 ppm TWA MAK; 2400 mg/m3 TWA MAK	Not established	Not established	Not established

Exposure Limits/Guidelines (Con't.)

	Result	Italy	NIOSH	OSHA	OSHA Vacated	Portugal
	TWAs	667 ppm TWA; 2000 mg/m3 TWA	120 ppm TWA; 350 mg/m3 TWA	1000 ppm TWA; 2950 mg/m3 TWA	600 ppm TWA; 1800 mg/m3 TWA	600 ppm TWA [VLE-MP]

Pentane (109-66-0)	Ceilings	Not established	610 ppm Ceiling (15 min); 1800 mg/m3 Ceiling (15 min)	Not established	Not established	Not established
	STELs	Not established	Not established	Not established	750 ppm STEL; 2250 mg/m3 STEL	Not established
Hexane (110-54-3)	TWAs	20 ppm TWA; 72 mg/m3 TWA	50 ppm TWA; 180 mg/m3 TWA	500 ppm TWA; 1800 mg/m3 TWA	50 ppm TWA; 180 mg/m3 TWA	50 ppm TWA [VLE-MP]
Ethane (74-84-0)	TWAs	Not established	Not established	Not established	Not established	1000 ppm TWA [VLE-MP]
Propane (74-98-6)	TWAs	Not established	1000 ppm TWA; 1800 mg/m3 TWA	1000 ppm TWA; 1800 mg/m3 TWA	1000 ppm TWA; 1800 mg/m3 TWA	1000 ppm TWA [VLE-MP]
Methane (74-82-8)	TWAs	Not established	Not established	Not established	Not established	1000 ppm TWA [VLE-MP]
Butane (106-97-8)	TWAs	Not established	800 ppm TWA; 1900 mg/m3 TWA	Not established	800 ppm TWA; 1900 mg/m3 TWA	Not established

Exposure Limits/Guidelines (Con't.)

	Result	Spain	Sweden
Pentane (109-66-0)	TWAs	1000 ppm TWA [VLA-ED] (indicative limit value); 3000 mg/m3 TWA [VLA-ED] (indicative limit value)	600 ppm LLV; 1800 mg/m3 LLV
	STELs	Not established	750 ppm STV; 2000 mg/m3 STV
Hexane (110-54-3)	TWAs	20 ppm TWA [VLA-ED] (indicative limit value); 72 mg/m3 TWA [VLA-ED] (indicative limit value)	25 ppm LLV; 90 mg/m3 LLV
	Under Review	0.2 mg/L Medium: urine Time: end of workweek Parameter: 2,5-Hexanedione (without hydrolysis; means free 2,5-hexanedione, unconjugated. This substance is a metabolite of n-hexane and methyl-n-butyl ketone it means after four or five consecutive days of work with exposure, as soon as possible after the end of the last working day, as biological indicators are eliminated with half-lives greater than five hours; these indicators accumulate in the body during the work week, therefore the sampling time is critical in relation to previous	Not established

		exposures.)	
	Biological Limit Values (BLV)	0.4 mg/L urine end of workweek 2,5-Hexanedione (without hydrolysis) (1,8)	Not established
	STELs	Not established	50 ppm STV; 180 mg/m3 STV
Ethane (74-84-0)	TWAs	1000 ppm TWA [VLA-ED]	Not established
Propane (74-98-6)	TWAs	1000 ppm TWA [VLA-ED]	Not established
Methane (74-82-8)	TWAs	1000 ppm TWA [VLA-ED]	Not established
Butane (106-97-8)	TWAs	1000 ppm TWA [VLA-ED]	Not established

Exposure Control Notations

Portugal

•Hexane (110-54-3): **Skin:** (skin - potential for cutaneous exposure)

•Helium (7440-59-7): **Simple Asphyxiants:** (Simple Asphyxiant)

Italy

•Butane (106-97-8): **Carcinogens:** (Category 1 Carcinogen (containing >= 0.1% Butadiene)) | **Mutagens:** (Category 2 Mutagen (containing >= 0.1% Butadiene))

France

•Hexane (110-54-3): **Reproductive Toxins:** (Reproductive Toxin category 3)

Ireland

•Ethane (74-84-0): **Simple Asphyxiants:** (Asphyxiant)

•Methane (74-82-8): **Simple Asphyxiants:** (Asphyxiant)

•Propane (74-98-6): **Simple Asphyxiants:** (Asphyxiant)

•Helium (7440-59-7): **Simple Asphyxiants:** (Asphyxiant)

Spain

•Helium (7440-59-7): **Simple Asphyxiants:** (simple asphyxiant)

Germany DFG

•Butane (106-97-8): **Pregnancy:** (classification not yet possible)

•Hexane (110-54-3): **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to)

•Pentane (109-66-0): **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to)

•Propane (74-98-6): **Pregnancy:** (classification not yet possible)

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

- 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

- Wear safety glasses.

Skin/Body

- 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

LLV = Limit Level Value is the exposure limit for 8-hour work day

MAK = Maximale Arbeitsplatz Konzentration is the maximum permissible concentration

NIOSH = National Institute of Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

STEL = Short Term Exposure Limits are based on 15-minute exposures

TWAEV = Time-Weighted Average Exposure Value

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 gas with odor ranging from none to gasoline-like odor.
Color	Colorless	Odor	Odorless to Gasoline-like.
Odor Threshold	Data lacking	Physical and Chemical Properties	Data lacking
General Properties			
Boiling Point	-268.94 C(-452.092 F) Helium	Melting Point	-272 C(-457.6 F) Helium
Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	Data lacking	Water Solubility	Slightly Soluble Helium
Viscosity	Data lacking	Explosive Properties	Not explosive.
Oxidizing Properties:	Not an oxidizing gas.		
Volatility			
Vapor Pressure	Data lacking	Vapor Density	0.138 Air=1 Helium
Evaporation Rate	Data lacking		
Flammability			
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	Data lacking
Flammability (solid, gas)	Not flammable.		
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

- Oxidizing agents.

10.6 Hazardous decomposition products

- None known.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Butane (0.01%)	106-97-8	**Acute Toxicity:** Inhalation-Rat LC50 • 658 g/m³ 4 Hour(s)
Hexane (0.01%)	110-54-3	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 25 g/kg; Inhalation-Rat LC50 • 48000 ppm 4 Hour(s); **Irritation:** Eye-Rabbit • 10 mg • Mild irritation; **Reproductive:** Inhalation-Rat TCLo • 5000 ppm (6-19D preg); *Reproductive Effects:Specific Developmental Abnormalities*:**Musculoskeletal system**; *Reproductive Effects:Specific Developmental Abnormalities*:**Urogenital system**
Pentane (0.01%)	109-66-0	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • >2000 mg/kg; Inhalation-Rat LC50 • 364 g/m³ 4 Hour(s)

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)

- This material is a simple asphyxiant. May displace or reduce oxygen available for

breathing especially in confined spaces. If this material is released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with decreased levels of oxygen: increase in breathing and pulse rate, emotional upset, abnormal fatigue, nausea, vomiting, collapse, loss of consciousness, convulsive movements, respiratory collapse and death.

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)
- 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.

Key to abbreviations
LC = Lethal Concentration
LD = Lethal Dose
TC = Toxic Concentration

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 waste
- Dispose 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. (Helium)	2.2	NDA	NDA
TDG	UN1956	COMPRESSED GAS, N.O.S. (Helium)	2.2	NDA	NDA
IMO/IMDG	UN1956	COMPRESSED GAS, N.O.S. (Helium)	2.2	NDA	NDA
IATA/ICAO	UN1956	Compressed gas, n.o.s. (Helium)	2.2	NDA	NDA

14.6 Special precautions for user

- Cylinders should be transported in a secure position, in a well-ventilated vehicle. The 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**
Butane	106-97-8	Yes	Yes	Yes
Ethane	74-84-0	Yes	Yes	Yes
Helium	7440-59-7	Yes	Yes	Yes
Hexane	110-54-3	Yes	Yes	Yes
Methane	74-82-8	Yes	Yes	Yes
Pentane	109-66-0	Yes	Yes	Yes
Propane	74-98-6	Yes	Yes	Yes

Inventory						
Component	**CAS**	**Canada DSL**	**Canada NDSL**	**China**	**EU EINECS**	**EU ELNICS**
Butane	106-97-8	Yes	No	Yes	Yes	No
Ethane	74-84-0	Yes	No	Yes	Yes	No
Helium	7440-59-7	Yes	No	Yes	Yes	No
Hexane	110-54-3	Yes	No	Yes	Yes	No
Methane	74-82-8	Yes	No	Yes	Yes	No
Pentane	109-66-0	Yes	No	Yes	Yes	No

Propane	74-98-6	Yes	No	Yes	Yes	No

Inventory (Con't.)		
Component	**CAS**	**TSCA**
Butane	106-97-8	Yes
Ethane	74-84-0	Yes
Helium	7440-59-7	Yes
Hexane	110-54-3	Yes
Methane	74-82-8	Yes
Pentane	109-66-0	Yes
Propane	74-98-6	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

• Pentane	109-66-0	B2
• Ethane	74-84-0	A, B1
• Propane	74-98-6	A, B1
• Butane	106-97-8	A, B1
• Hexane	110-54-3	B2, D2A, D2B
• Helium	7440-59-7	A
• Methane	74-82-8	A, B1

Canada - WHMIS - Ingredient Disclosure List

• Pentane	109-66-0	1 %
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	1 %
• Hexane	110-54-3	1 %
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

Environment

Canada - CEPA - Priority Substances List

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

China

Environment

China - Ozone Depleting Substances - First Schedule

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed

• Methane	74-82-8	Not Listed

China - Ozone Depleting Substances - Second Schedule

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

China - Ozone Depleting Substances - Third Schedule

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

Other

China - Annex I & II - Controlled Chemicals Lists

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

China - Dangerous Goods List

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	(including refrigerated liquid)
• Propane	74-98-6	
• Butane	106-97-8	
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	(compressed or refrigerated liquid)
• Methane	74-82-8	(compressed or refrigerated liquid)

China - Export Control List - Part I Chemicals

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

Europe

Other

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification

• Pentane	109-66-0	F+; R12 N; R51-53 Xn; R65 R66 R67
• Ethane	74-84-0	F+; R12
• Propane	74-98-6	F+; R12
• Butane	106-97-8	F+; R12
• Hexane	110-54-3	F; R11 Xi; R38 N; R51-53 Repr.Cat.3; R62 Xn; R65-48/20 R67
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	F+; R12

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	5%<=C: Xn; R:48/20
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling

• Pentane	109-66-0	F+ Xn N R:12-51/53-65-66-67 S:(2)-9-16-29-33-61-62
• Ethane	74-84-0	F+ R:12 S:(2)-9-16-33
• Propane	74-98-6	F+ R:12 S:(2)-9-16
• Butane	106-97-8	F+ R:12 S:(2)-9-16
• Hexane	110-54-3	F Xn N R:11-38-48/20-62-65-67-51/53 S:(2)-9-16-29-33-36/37-61-62
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	F+ R:12 S:(2)-9-16-33

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations

• Pentane	109-66-0	C
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	C
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases

• Pentane	109-66-0	S:(2)-9-16-29-33-61-62
• Ethane	74-84-0	S:(2)-9-16-33
• Propane	74-98-6	S:(2)-9-16
• Butane	106-97-8	S:(2)-9-16
• Hexane	110-54-3	S:(2)-9-16-29-33-36/37-61-62
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	S:(2)-9-16-33

Germany

Environment

Germany - TA Luft - Types and Classes

• Pentane	109-66-0	Not Listed

• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

Germany - Water Classification (VwVwS) - Annex 1

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	ID Number 91, not considered hazardous to water
• Propane	74-98-6	ID Number 560, not considered hazardous to water
• Butane	106-97-8	ID Number 561, not considered hazardous to water (1,3-Butadiene <0.1%)
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	ID Number 1343, not considered hazardous to water

Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes

• Pentane	109-66-0	ID Number 452, hazard class 2 - hazard to waters
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	ID Number 124, hazard class 2 - hazard to waters
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

Germany - Water Classification (VwVwS) - Annex 3

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

Other

Germany - Specifically Regulated Chemicals in TRGS

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

Portugal

Other

Portugal - Prohibited Substances

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

United Kingdom

Environment

United Kingdom - Pollution Inventory - Schedule 1 - Thresholds for Releases to Air

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	10000 kg

Other

United Kingdom - Workplace Exposure Limits (WELs) - Substances in Review

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

United Kingdom - List of Dangerous Substances in Water

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Pentane	109-66-0	Not Listed

• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	5000 lb final RQ; 2270 kg final RQ
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	1.0 % de minimis concentration
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed

• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

United States - Pennsylvania

Labor

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

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	Not Listed
• Methane	74-82-8	Not Listed

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

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Helium	7440-59-7	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
  H225 - Highly flammable liquid and vapour
  H304 - May be fatal if swallowed and enters airways
  H315 - Causes skin irritation
  H336 - May cause drowsiness or dizziness

H373 - May cause damage to organs through prolonged or repeated exposure.
H411 - Toxic to aquatic life with long lasting effects

R11 - Highly flammable.
R12 - Extremely flammable.
R38 - Irritating to skin.
R48/20 - Harmful: danger of serious damage to health by prolonged exposure through inhalation.
R51 - Toxic to aquatic organisms.
R53 - May cause long-term adverse effects in the aquatic environment.
R62 - Possible risk of impaired fertility.
R65 - Harmful: may cause lung damage if swallowed.
R66 - Repeated exposure may cause skin dryness or cracking.
R67 - Vapours may cause drowsiness and dizziness.

Last Revision Date

- 09/October/2014

Preparation Date

- 25/July/2012

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