Propane

Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 05/10/2017 Version: 1.0

SECTION 1: Identification

1.1. Product identifier

Product form	:	Substance
Substance name	:	Propane
CAS-No.	:	74-98-6
Product code	:	CA-1001-06868
Formula	:	C_3H_8
Synonyms	:	Propane liquefied / Dimethylmethane / Freon 290 / n-Propane / Propyl hydride

1.2. Recommended use and restrictions on use

Recommended uses and restrictions	:	Manufacture of substances Semiconductor Purposes Laboratory chemicals

1.3. Supplier

Air Liquide Canada Inc.
1250, René Lévesque West Blvd. Suite 1700
H3B 5E6 Montreal, QC - Canada
T 1-800-817-7697
www.airliquide.ca

1.4. Emergency telephone number

Emergency number	:	514-878-1667

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

Classification (GHS-CA)

Flammable gases, Category 1 H220
Gases under pressure : Liquefied gas H280

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms (GHS-CA) :

GHS02 GHS04

Signal word (GHS-CA) : Danger

Hazard statements (GHS-CA) :
H280 - Contains gas under pressure; may explode if heated
H220 - Extremely flammable gas
OSHA-H01 - May displace oxygen and cause rapid suffocation
CGA-HG01 - May cause frostbite
CGA-HG04 - May form explosive mixtures with air

Precautionary statements (GHS-CA) :
P381 - In case of leakage, eliminate all ignition sources
P377 - Leaking gas fire: Do not extinguish unless leak can be stopped safely
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations.
P403 - Store in a well-ventilated place
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
P308+P313 - IF exposed or concerned: Get medical advice/attention
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P271 - Use only outdoors or in a well-ventilated area
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P302 - IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area, Get immediate medical advice/attention
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52 °C/125 °F

CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG06 - Close valve after each use and when empty
CGA-PG10 - Use only with equipment rated for cylinder pressure
CGA-PG14 - Approach suspected leak area with caution
CGA-PG21 - Open valve slowly

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Chemical name/Synonyms	Product identifier	%	Classification (GHS-CA)
Propane (Main constituent)	Propane liquefied / Dimethylmethane / Freon 290 / n-Propane / Propyl hydride	(CAS-No.) 74-98-6	> 99	Flam. Gas 1, H220 Press. Gas (Liq.), H280

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

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact : Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

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

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

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

Symptoms/effects after skin contact : May cause frostbite.

Symptoms/effects after eye contact : Contact with the product may cause cold burns or frostbite.

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

Symptoms/effects upon intravenous administration : Not known.

Chronic symptoms : Adverse effects not expected from this product.

Most important symptoms and effects, both acute and delayed : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

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

5.2. Unsuitable extinguishing media

Unsuitable extinguishing media : Do not use water jet to extinguish.

5.3. Specific hazards arising from the hazardous product

Fire hazard : This product is flammable.

Explosion hazard : Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries. May form flammable/explosive vapour-air mixture.

Hazardous combustion products : Incomplete combustion may form carbon monoxide.

5.4. Special protective equipment and precautions for fire-fighters

Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Exposure to fire may cause containers to rupture/explode.

Protection during firefighting	:	Standard protective clothing and equipment (e.g, Self Contained Breathing Apparatus) for fire fighters. 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

General measures	:	Ensure adequate ventilation.
Personal Precautions, Protective Equipment and Emergency Procedures	:	EVACUATE ALL PERSONNEL FROM AFFECTED AREA. Use appropriate protective equipment. If leak is on user's equipment, be certain to purge piping before attempting repairs. If leak is on a container or container valve contact the closest Air Liquide Canada location.

6.2. Methods and materials for containment and cleaning up

For containment	:	Try to stop release if without risk.
Methods for cleaning up	:	Dispose of contents/container in accordance with local/regional/national/international regulations.
Methods and material for containment and cleaning up	:	Ventilate area.

6.3. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection"

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	:	Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Use only non-sparking tools.
Hygiene measures	:	Do not eat, drink or smoke when using this product.
Additional hazards when processed	:	Pressurized container: Do not pierce or burn, even after use. Use only with equipment rated for cylinder pressure. Close valve after each use and when empty. Handle empty containers with care because residual vapours are flammable. In use may form flammable vapour-air mixture.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures	:	Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed.
Storage conditions	:	Do not expose to temperatures exceeding 52 °C/ 125 °F. Keep container closed when not in use. Protect cylinders from physical damage; do not drag, roll, slide or drop. Store in well ventilated area.
Incompatible products	:	None known.
Incompatible materials	:	Oxidizing materials. Air.
Conditions for safe storage, including any incompatibilities	:	Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Container valve guards or caps should be in place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Keep container below 50°C in a well ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials. Segregate from oxidant gases and other oxidants in store. All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Propane (74-98-6)		
USA - OSHA	OSHA PEL (TWA) (mg/m³)	1800 mg/m³
USA - OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
Canada (Quebec)	VEMP (mg/m³)	1800 mg/m³
Canada (Quebec)	VEMP (ppm)	1000 ppm
Alberta	OEL TWA (ppm)	1000 ppm
British Columbia	OEL TWA (ppm)	1000 ppm
Nunavut	OEL STEL (ppm)	1250 ppm
Nunavut	OEL TWA (ppm)	1000 ppm
Northwest Territories	OEL STEL (ppm)	1250 ppm
Northwest Territories	OEL TWA (ppm)	1000 ppm
Saskatchewan	OEL STEL (ppm)	1250 ppm

Propane (74-98-6)		
Saskatchewan	OEL TWA (ppm)	1000 ppm

8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure exposure is below occupational exposure limits (where available). Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Oxygen detectors should be used when asphyxiating gases may be released. Consider the use of a work permit system e.g. for maintenance activities.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Gloves. Safety glasses. Protective clothing. Safety shoes.

Hand protection:

Wear working gloves when handling gas containers.

Eye protection:

Wear safety glasses with side shields.

Skin and body protection:

Wear suitable protective clothing, e.g. lab coats, coveralls or flame resistant clothing.

Respiratory protection:

None necessary during routine operations. See Sections 5 & 6

Thermal hazard protection:

None necessary during routine operations.

Other information:

Wear safety shoes while handling containers.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Gas
Appearance	:	Colorless gas.
Colour	:	Colourless.
Odour	:	Odourless Stenchant often added.
Odour threshold	:	No data available
pH	:	Not applicable.
Relative evaporation rate (butylacetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable for gases and gas mixtures.
Molecular mass	:	44.11 g/mol
Melting point	:	-187.69 °C
Freezing point	:	-187.69 °C
Boiling point	:	-42.04 °C
Flash point	:	Not applicable for gases and gas mixtures.
Critical temperature	:	97.65 °C
Auto-ignition temperature	:	450 °C
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	See Section 2.1 and 2.2
Vapour pressure	:	756.9 kPa at 21.1 °C
Vapour pressure at 50 °C	:	No data available
Critical pressure	:	4248 kPa

Relative density	:	No data available
Density	:	1.858 kg/m³ at 21.1 °C
Relative gas density	:	1.52
Solubility	:	Water: 0.065 g/l
Log Pow	:	2.36
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Without adequate ventilation formation of explosive mixtures may be possible.
Oxidising properties	:	None.
Explosive limits	:	2.2 - 9.5 vol %

9.2. Other information

Gas group	:	Press. Gas (Liq.)
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

Reactivity	:	None known.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	May react violently with oxidants. Can form explosive mixture with air.
Conditions to avoid	:	Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Incompatible materials	:	Air, Oxidisers. For additional information on compatibility refer to ISO 11114.
Hazardous decomposition products	:	Under normal conditions of storage and use hazardous decomposition products should not be produced.

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: Not classified.

Propane (\f)74-98-6	
LC50 inhalation rat (mg/l)	658 mg/l/4h
LC50 inhalation rat (ppm)	282800 ppm/4h
ATE CA (gases)	282800.00000000 ppmv/4h
ATE CA (vapours)	658.00000000 mg/l/4h
ATE CA (dust,mist)	658.00000000 mg/l/4h

Skin corrosion/irritation	:	Not classified pH: Not applicable.
Serious eye damage/irritation	:	Not classified pH: Not applicable.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
STOT-single exposure	:	Not classified
STOT-repeated exposure	:	Not classified
Aspiration hazard	:	Not classified

Propane (74-98-6)	
Hydrocarbon	Yes

SECTION 12: Ecological information

12.1. Toxicity

Propane (74-98-6)	
LC50-96 h - fish [mg/l]	49.9 mg/l
EC50 48h - Daphnia magna [mg/l]	27.1 mg/l
EC50 72h Algae [mg/l]	11.9 mg/l

12.2. Persistence and degradability

Propane (74-98-6)	
Persistence and degradability	The substance is readily biodegradable. Unlikely to persist.

12.3. Bioaccumulative potential

Propane (74-98-6)	
Log Pow	2.36
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Propane (74-98-6)	
Log Pow	2.36
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

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

Effect on ozone layer : None.

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods : Contact supplier if guidance is required. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded. Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into areas where there is a risk of forming an explosive mixture with air.

Product/Packaging disposal recommendations : Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at www.cganet.com for more guidance on suitable disposal methods.

List of hazardous wastes : 16 05 04 *: Gases in pressure containers (including halons) containing dangerous substances.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

Transportation of Dangerous Goods

UN-No. (TDG) : UN1978

TDG Primary Hazard Classes : 2.1 - Class 2.1 - Flammable Gas.

Transport Document Description : UN1978 PROPANE, 2.1

Proper Shipping Name : PROPANE

Hazard labels (TDG) : 2.1 - Flammable gases

TDG Special Provisions : 88 - Despite the quantity limits in column 9 of Schedule 1 for these dangerous goods, a road vehicle is not a passenger carrying road vehicle unless the passengers in it are transported for hire or reward. SOR/2008-34

ERAP Index : 3 000

Explosive Limit and Limited Quantity Index : 0.125 L

Passenger Carrying Ship Index : 110 kg

Excepted quantities (TDG) : E0

Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : Forbidden

14.2. Transport information/DOT - USA

Department of Transport

DOT NA no.	:	UN1978
UN-No.(DOT)	:	1978
Transport Document Description	:	UN1978 Propane see also Petroleum gases, liquefied, 2.1
Proper Shipping Name (DOT)	:	Propane see also Petroleum gases, liquefied
Contains Statement Field Selection (DOT)	:	DOT_TECHNICAL - Proper Shipping Name - Technical (DOT)
Class (DOT)	:	2.1 - Class 2.1 - Flammable gas 49 CFR 173.115
Division (DOT)	:	2.1
Hazard labels (DOT)	:	2.1 - Flammable gas

Dangerous for the environment	:	No
DOT Special Provisions (49 CFR 172.102)	:	19 - For domestic transportation only, the identification number UN1075 may be used in place of the identification number specified in column (4) of the 172.101 table. The identification number used must be consistent on package markings, shipping papers and emergency response information. T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	306
DOT Packaging Non Bulk (49 CFR 173.xxx)	:	304
DOT Packaging Bulk (49 CFR 173.xxx)	:	314;315
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	150 kg
DOT Vessel Stowage Location	:	E - The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded.
DOT Vessel Stowage Other	:	40 - Stow ‘‘clear of living quarters’’
Emergency Response Guide (ERG) Number	:	115 (UN1075)
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 cylinder 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.
Other information	:	No supplementary information available.

14.3. Air and sea transport

IMDG

UN-No. (IMDG)	:	1978
Proper Shipping Name (IMDG)	:	Propane
Transport Document Description (IMDG)	:	UN 1978 Propane, 2.1
Class (IMDG)	:	2.1 - Flammable gases
MFAG-No	:	115
Ship Safety Act	:	Gases under pressure/Gases flammable under pressure(Dangerous Goods Notification Schedule first second and third Article Dangerous Goods Regulations)
Port Regulation Law	:	Hazardous materials/High pressure gas (Article 21, Paragraph 2 of Law, Article 12 rule, notice attached table that defines the type of dangerous goods)

IATA

UN-No. (IATA)	:	1978

Proper Shipping Name (IATA)	:	Propane
Transport Document Description (IATA)	:	UN 1978 Propane, 2.1
Class (IATA)	:	2.1 - Gases : Flammable
Civil Aeronautics Law	:	Gases under pressure/Gases flammable under pressure(Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations)

SECTION 15: Regulatory information

15.1. National regulations

Propane (74-98-6)
Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

Propane (74-98-6)
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 EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory 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 the United States TSCA (Toxic Substances Control Act) inventory Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on Turkish inventory of chemical

SECTION 16: Other information

Date of issue : 05/10/2017

Full text of H-statements:

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

SDS Canada (GHS)

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