

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Chemical type	: Mixture
Trade name	: Propane
EC index no	: 601-003-00-5
EC no	: 200-827-9
CAS No.	: 74-98-6
REACH registration No.	: Not applicable
Product code	: 61N; SDS # PbR0114
Synonyms	: Special and Commercial Propane

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

1.2.1. Relevant identified uses

Use of the substance/preparation	: Manufacture of substances Formulation [mixing] of preparations and/or re-packaging Polymer preparations and compounds Fuels Functional fluids Blowing agent Propellant gas
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1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Petrobras International Braspetro B.V. – PIB BV
Prins Bernhardplein 200, 1097 – JB Amsterdam
The Netherlands

All communications shall be addressed exclusively to the following address:

Petrobras Europe Ltd
4th Floor, 20 North Audley Street
London W1K 6WL – United Kingdom
Fax number: +44(0) 20 7355 8750
E-mail: reach@petrobras.com.br

1.4. Emergency telephone number

Emergency number	: For Chemical Emergency, Spill, Leak, Fire, Exposure or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300 Outside USA and Canada (collect calls accepted): 1-703-527-3887
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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flam. Gas 1 H220
Compressed gas H280

Full text of H-phrases: see section 16.

Classification according to Directive 67/548/EEC or 1999/45/EC

F+; R12

Full text of R-phrases: see section 16.

Adverse physicochemical, human health and environmental effects

Contact with product may cause cold burns or frostbite. Asphyxiant in high concentrations.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



GHS02

GHS04

Signal word (CLP) : Danger

Hazard statements (CLP) : H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated

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Precautionary statements (CLP) : P102 - Keep out of reach of children
P210 - Keep away from sparks, open flames. - No smoking.
P243 - Take precautionary measures against static discharge
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - In case of leaking gas fire, eliminate all ignition sources if safe to do so.
P410+P403 - Protect from sunlight. Store in a well-ventilated place

Labelling according to Directive 67/548/EEC or 1999/45/EC

Hazard symbols :



F+ - Extremely flammable

R-phrases : R12 - Extremely flammable.
S-phrases : S2 - Keep out of the reach of children.
S9 - Keep container in a well-ventilated place.
S16 - Keep away from sources of ignition - No smoking.

2.3. Other hazards

This substance/mixture does not meet the PBT/vPvB criteria of REACH, annex XIII.

other hazards which do not result in classification : Contact with product may cause cold burns or frostbite. In high concentrations may cause asphyxiation. Contributes to the formation of photochemical smog by degradation in the atmosphere through photochemical reactions to form photochemical oxidants and interfering with the photochemical cycle of nitrogen oxides.

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	Classification according to Directive 67/548/EEC
Propane	(CAS No.) 74-98-6 (EC no) 200-827-9 (EC index no) 601-003-00-5	90- 100	F+; R12
Propylene	(CAS No.) 115-07-1 (EC no) 204-062-1 (EC index no) 601-011-00-9	<= 5	F+; R12
Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Propane	(CAS No.) 74-98-6 (EC no) 200-827-9 (EC index no) 601-003-00-5	90- 100	Flam. Gas 1, H220
Propylene	(CAS No.) 115-07-1 (EC no) 204-062-1 (EC index no) 601-011-00-9	<= 5	Flam. Gas 1, H220

Full text of R-, H- and EUH-phrases: see section 16.

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. In case of breathing difficulties administer oxygen. In case of irregular breathing or respiratory arrest provide artificial respiration. Seek medical advice. If medical advice is needed, have product container or label at hand.

First-aid measures after skin contact : Contact with liquefied gas may cause frostbite. Rinse immediately with plenty of water (for at least 15 minutes). Seek medical advice (show the label where possible).

First-aid measures after eye contact : In case of contact with eyes, rinse immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Subsequently consult an ophthalmologist. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical advice (show the label where possible).

First-aid measures after ingestion : not applicable.

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

Symptoms/injuries after inhalation : Harmful by inhalation. Asphyxiant gas. Excessive concentrations may cause nervous system depression, headache, and weakness leading to unconsciousness.

Symptoms/injuries after skin contact : Contact with product may cause cold burns or frostbite.

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

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

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

Avoid any direct contact with the product. Keep victim warm and rested. Never give anything by mouth to an unconscious person.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: : dry chemical powder, alcohol-resistant foam, carbon dioxide (CO₂). Water fog.
Unsuitable extinguishing media : Do not use water jet. Do not aim water directly at point where compressed gas is escaping, as the water may freeze.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Extremely flammable gas. Cool tanks/drums with water spray/remove them into safety. Contains gas under pressure; may explode if heated. Do not put out flammable gas fire before gas flow is stopped, to avoid reignition. Combustion generates : Asphyxiating. vapours.
Explosion hazard : Contains gas under pressure; may explode if heated. Formation of potentially explosive mixtures with: Direct sunlight. Chlorine (Cl₂). Oxidizing agents.
Reactivity : No data available.

5.3. Advice for firefighters

Firefighting instructions : Spray with water from distance to stay away from possible explosion. Do not use a water jet since it may cause the fire to spread. Cool tanks/drums with water spray/remove them into safety.
Protective equipment for firefighters : In case of fire: Wear self-contained breathing apparatus. Wear proper protective equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Refer to section 8.
Emergency procedures : This product is flammable. Remove all sources of ignition. Do not handle until all safety precautions have been read and understood. May cause frostbite on contact with the liquid. Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment : Refer to section 8.

6.2. Environmental precautions

Use water spray to minimise or disperse vapours. In case of insufficient ventilation and/or through use, explosive/highly flammable mixtures may develop. Assure complete dissipation of gas below its lower explosive limit.

6.3. Methods and material for containment and cleaning up

For containment : Stop leak if safe to do so. Ventilate affected area.
Methods for cleaning up : Stop leak if safe to do so. Ventilate affected area.
Other information : Remove all sources of ignition.

6.4. Reference to other sections

Refer to sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Extremely flammable liquefied gas. Avoid contact with skin, eyes and clothing. Do not breathe gas/vapour. If inspection shows cylinders in poor condition, contact immediately the supplier. Containers must be properly grounded before beginning transfer. Use grounded electrical/mechanical equipment. Use explosion-proof ventilating equipment. Use only non-sparking tools. Exposure to fire may cause containers to rupture/explode. Handle in accordance with good industrial hygiene and safety procedures. Take off contaminated clothing and wash before reuse. Measure the oxygen concentration in the air. Refer to section 8. Don't wear contact lenses. Remove all sources of ignition.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: : Ground equipment electrically. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Only use anti-static equipped (spark-free) tools. Protect containers against damage. Provide adequate ventilation. Use only in well-ventilated areas. Use explosion-proof ventilating equipment.
Storage condition(s) : Ensure cylinder valve is closed and not leaking. Ensure valve protection device (where provided) is correctly fitted. Explosive vapour/air mixtures may be formed. Store at room temperature.
Incompatible products : Oxidizing agent.
Incompatible materials : Chlorine (Cl₂). Protect from direct sunlight. water, humidity.
Maximum storage period : 6 months

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- Storage area : Containers which are opened should be properly resealed and kept upright to prevent leakage. Secure gas cylinder against overturning. The floor of the depot should be impermeable and designed to form a tight basin.
- Packaging materials : Keep only in the original container. carbon steel.

7.3. Specific end use(s)

No data available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Propane (74-98-6)		
Austria	MAK (mg/m ³)	1800 mg/m ³
Austria	MAK (ppm)	1000 ppm
Austria	MAK Short time value (mg/m ³)	3600 mg/m ³
Austria	MAK Short time value (ppm)	2000 ppm
Germany	TRGS 900 Occupational exposure limit value (mg/m ³)	1800 mg/m ³
Germany	TRGS 900 Occupational exposure limit value (ppm)	1000 ppm
Italy - Portugal - USA ACGIH	ACGIH TWA (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1800 mg/m ³
USA NIOSH	NIOSH REL (TWA) (ppm)	1000 ppm
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1800 mg/m ³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
Switzerland	VLE (mg/m ³)	7200 mg/m ³
Switzerland	VLE (ppm)	4000 ppm
Switzerland	VME (mg/m ³)	1800 mg/m ³
Switzerland	VME (ppm)	1000 ppm
Denmark	Grænseværdie (langvarig) (mg/m ³)	1800 mg/m ³
Denmark	Grænseværdie (langvarig) (ppm)	1000 ppm
Denmark	Grænseværdie (kortvarig) (mg/m ³)	3600 mg/m ³
Denmark	Grænseværdie (kortvarig) (ppm)	2000 ppm
Finland	HTP-arvo (8h) (mg/m ³)	1500 mg/m ³
Finland	HTP-arvo (8h) (ppm)	800 ppm
Finland	HTP-arvo (15 min)	2000 mg/m ³
Finland	HTP-arvo (15 min) (ppm)	1100 ppm
Norway	Gjennomsnittsverdier (AN) (mg/m ³)	900 mg/m ³
Norway	Gjennomsnittsverdier (AN) (ppm)	500 ppm
Poland	NDS (mg/m ³)	1800 mg/m ³
Canada (Quebec)	VEMP (mg/m ³)	1800 mg/m ³
Canada (Quebec)	VEMP (ppm)	1000 ppm

Propylene (115-07-1)		
Italy - Portugal - USA ACGIH	ACGIH TWA (ppm)	500 ppm
Switzerland	VME (mg/m ³)	17500 mg/m ³
Switzerland	VME (ppm)	10000 ppm
Denmark	Grænseværdie (langvarig) (mg/m ³)	172 mg/m ³
Denmark	Grænseværdie (langvarig) (ppm)	100 ppm
Denmark	Grænseværdie (kortvarig) (mg/m ³)	344 mg/m ³
Denmark	Grænseværdie (kortvarig) (ppm)	200 ppm
Lithuania	IPRV (mg/m ³)	900 mg/m ³
Lithuania	IPRV (ppm)	500 ppm
Poland	NDS (mg/m ³)	2000 mg/m ³
Poland	NDSch (mg/m ³)	8600 mg/m ³

8.2. Exposure controls

- Appropriate engineering controls : Mechanical ventilation is recommended. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

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Hand protection	: Protective gloves made of PVC.
Eye protection	: Safety glasses with face shield.
Skin and body protection	: Wear suitable protective clothing.
Respiratory protection	: In case of insufficient ventilation, wear suitable respiratory equipment. An approved organic vapour respirator/supplied air or self-contained breathing apparatus must be used when vapour concentration exceeds applicable exposure limits.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Colourless gas.
Colour	: colourless.
Odour	: rotten eggs.
Odour threshold	: No data available
pH	: Not applicable
Melting point	: -187 °C
Solidification point	: No data available
Boiling point	: -42 °C
Flash point	: -156 °C (Closed cup)
Relat. evapor. rate comp. to butylacetate	: No data available
Flammability (solid, gas)	: No data available
Explosive limits	: 2.2-9.5 vol %
Vapour pressure	: 14710 hPa @ 37.8 °C
Relative vapour density at 20 °C	: 1.56
Relative density	: No data available
Relative gas density	: 0.583
Solubility	: Soluble in ether. Water: insoluble
Log Pow	: 2.36
Self ignition temperature	: 450 °C
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available

9.2. Other information

Gas group	: Compressed gas
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SECTION 10: Stability and reactivity

10.1. Reactivity

No data available.

10.2. Chemical stability

The product is stable at normal handling- and storage conditions. No polymerization .

10.3. Possibility of hazardous reactions

Vapours may form explosive mixtures with air. Explosive with contact with : oxygen. butane. Nickel (Ni). Carbonyl. Reaction takes place from the temperatures of: 20-40°C.

10.4. Conditions to avoid

No data available.

10.5. Incompatible materials

Oxidizing agents. Oxygen. butane. Nickel (Ni). Carbonyl.

10.6. Hazardous decomposition products

Asphyxiant gas. Carbon monoxide. carbon dioxide (CO₂).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: Not classified
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Propane (74-98-6)	
LD50 oral rat	539600 mg/kg
Propylene (115-07-1)	
LC50 inhalation rat (ppm)	50000 ppm/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	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified

Propane (74-98-6)	
LOAEL (inhalation, rat, gas, 28 days)	12000 ppmV/6h/day
NOAEL (subacute, oral, animal/male, 28 days)	4000 mg/kg bodyweight (inhalation)
NOAEL (subacute, oral, animal/female, 28 days)	120000 mg/kg bodyweight (inhalation)

Propylene (115-07-1)	
LOAEL (inhalation, rat, gas, 90 days)	5000 ppmV/6h/day
NOAEL (inhalation, rat, gas, 90 days)	10000 ppmV/6h/day

Aspiration hazard	: Not classified
Potential Adverse human health effects and symptoms	: Container leak into confined storage space can deplete oxygen and cause asphyxiation. Inhalation may affect the nervous system causing headache, possibly dizziness, nausea, weakness, loss of coordination and unconsciousness. Contact with liquid may cause cold burns/frostbite. Asphyxia by lack of oxygen: risk of death.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - air	: Contributes to the formation of photochemical smog by degradation in the atmosphere through photochemical reactions to form photochemical oxidants and interfering with the photochemical cycle of nitrogen oxides.
Ecology - water	: Not harmful to aquatic organisms

Propane (74-98-6)	
LC50 fishes	49.9 mg/l 96 hours
EC50 Daphnia	27.14 mg/l 48 hours
ErC50 (algae)	11.89 mg/l 96 hours

Propylene (115-07-1)	
LC50 fishes	51.7 mg/l 96 hours
EC50 Daphnia	28.2 48 hours
LC50 fishes	5.3 30 days
EC50 Daphnia	3.1 16 days
ErC50 (algae)	12.1 mg/l 96 hours

12.2. Persistence and degradability

Propane (74-98-6)	
Persistence and degradability	Rapidly degradable. not bioaccumulative.

12.3. Bioaccumulative potential

Propane (74-98-6)	
Log Pow	2.36
Bioaccumulative potential	This product has little potential to bioaccumulate in aquatic organisms, is expected to rapidly degrade, and is not expected to persist.

12.4. Mobility in soil

No additional information available

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according to Regulation (EC) No. 453/2010

12.5. Results of PBT and vPvB assessment

Propane (74-98-6)

This substance/mixture does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects

Other adverse effects : Contributes to the formation of photochemical smog by degradation in the atmosphere through photochemical reactions to form photochemical oxidants and interfering with the photochemical cycle of nitrogen oxides.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Can be incinerated according to local regulations.
Waste disposal recommendations : Do not re-use empty containers. Handle empty containers with care because residual vapours are flammable.
Additional information : Dispose in a safe manner in accordance with local/national regulations.

SECTION 14: Transport information

In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

14.1. UN number

UN-No. : 1978

14.2. UN proper shipping name

Proper shipping name : PROPANE
Transport document description : UN 1978 PROPANE, 2.1, (B/D)

14.3. Transport hazard class(es)

Class (UN) : 2
Hazard labels (UN) : 2.1



14.4. Packing group

Packing group (UN) : Not applicable

14.5. Environmental hazards

Other information : No supplementary information available.

14.6. Special precautions for user

14.6.1. Overland transport

Hazard identification number (Kemler No.) : 23
Classification code : 2F
Orange plates :



Tunnel restriction code : B/D
Limited quantities (ADR) : LQ00
Excepted quantities (ADR) : E0

14.6.2. Transport by sea

No additional information available

14.6.3. Air transport

No additional information available

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

Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

No ingredients included in the REACH Candidate list

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Other regulations, restrictions and prohibition regulations : Compliance with following regulations: Regulation (EC) 1907/2006 as amended. Regulation (EC) 1272/2008 as amended. Directive 67/548/EEC as amended. Directive 1999/45/EC as amended.

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

CSA has not been carried out for the mixture.

SECTION 16: Other information

Sources of Key data : PETROBRAS. MSDS.

Abbreviations and acronyms : ASTM - American Society for Testing and Materials . CLP - Classification, Labelling and Packaging. CSR - Chemical Safety Report. EC - European Community. EEC - European Economic Community. GHS - Globally Harmonised System. REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals. SDS - Safety Data Sheet.

Full text of R-, H- and EUH-phrases:

Compressed gas	Gases under pressure Compressed gas
Flam. Gas 1	Flammable gases Category 1
H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated
R12	Extremely flammable.

SDS PETROBRAS USES

The information presented in this Safety Data Sheet is based on current knowledge and is believed to be complete and accurate. It describes the product for the purposes of health, safety and environment requirements only and shall, therefore, be used only as a guide. The data refers to a specific product and may not be valid for combined uses with other products. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. Petrobras shall not be responsible for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices.