



# MATERIAL SAFETY DATA SHEET

(According to GHS rev. 4)



## Mezcla Propano – Propileno

### 1.IDENTIFICATION

<b>Company:</b> YPF S.A. <b>Address:</b> Av. Macacha Güemes n° 515 CP C1106BKK <b>Buenos Aires - ARGENTINA</b> <b>Tel# (+ 5411) 5441-2000</b> <b>Fax# (+ 5411) 5441-5796</b>	<b>Commercial name:</b>  Propane-Propylene Mixture
	<b>Chemical name:</b> Hydrocarbons, petroleum distillate; petroleum gas.
	<b>Synonyms:</b> LPG.
	<b>Emergency Telephone:</b> <b>Argentina:</b> 0800-222-2933 <b>Other countries:</b> (+5411) 4613-1100

### 2.HAZARD IDENTIFICATION

#### 2.1 LABEL ELEMENTS

<b>Pictograms</b>			
<b>Warning word</b>	Peligro		
<b>Hazard statement</b>	H220 Extremely flammable gas	H280 Contains gas under pressure; may explode if heated	-
<b>Classification criteria</b>	Flammable Gases (Category 1)	Gases under pressure (Liquefied gas)	
<b>Other regulations</b>			

#### OTHER HAZARDS

Extremely flammable liquefied gas.  
Vapours form explosive mixtures with air.

### 3.COMPOSITION/INFORMATION ON INGREDIENTS

**General composition:** Complex combination of hydrocarbons produced by distillation and condensation of crude oil. It consists of hydrocarbons having carbon numbers in the range of C<sub>3</sub> through C<sub>5</sub>, predominantly C<sub>3</sub> - C<sub>4</sub>.

Main components	Range %	Classification	S Phrases
Propylene CAS # 115-07-1 EC # 204-062-1	60 (min.)	F+; R12	S9-16-33
Propane CAS # 74-98-6 EC # 200-827-9	40 (max.)	F+; R12	S9-16-33
Isobutane + n-Butane CAS # 75-28-5 EC # 200-857-2	2 (max.)	F+; R12	S9-16-33
2-Methyl propene CAS # 115-11-7 EC # 204-066-3	0.5 (max.)	F+; R12	S9-16-33

### 4. FIRST-AID MEASURES

**Inhalation:** Move the affected person to fresh air. If breathing is difficult, administer oxygen; in case of respiratory arrest, apply artificial respiration. Call for medical attention.

**Ingestion/Aspiration:** NP

**Contact skin/eyes:** In case of local frostbite, wash the affected area and remove contaminated clothes after wetting them properly, if they are not adhering to the skin. Do not rub the affected part. In contact with eyes, immediately flush with plenty of water for at least 15 minutes. Obtain medical aid as soon as possible.

**General measures:** Call for medical attention.

### 5. FIRE-FIGHTING MEASURES

**Extinguishing agents:** Water spray, dry chemicals, CO<sub>2</sub>.

**Non suitable extinguishing agents:** WATER SHOULD NEVER BE USED DIRECTLY.

**Combustion products:** CO<sub>2</sub>, H<sub>2</sub>O, CO (in incomplete combustion).

**Special measures:** Move containers away from fire area. Keep fire-exposed containers cool. Do not extinguish a leaking gas fire unless leak can be stopped. Try to stop leak if it is possible. If this is impossible, let fire burn. Water spray may disperse vapours. Consult and follow existing emergency standard procedures.

**Special hazards:** Extremely flammable/combustible product. May be ignited by heat, sparks, static electricity or flames. Vapour is heavier than air and may travel to remote ignition sources and flash back. Vapour displaces air in low lying and confined spaces, creating risk of asphyxia. Containers without security valves may explode after exposure to high temperatures. Empty containers are as dangerous as full ones. Vapour explosion hazard in confined areas, outdoors or in pipes. Runoff to sewer is especially dangerous due to fire and explosion hazard. Liquid floats on water and it may burn on water surface.

**Protective equipment:** Firefighters' protective clothing. At high concentration of vapours and/or fumes, self-contained breathing apparatus will be needed.

### 6. ACCIDENTAL RELEASE MEASURES

**Environmental precautions:** The product suffers strong evaporation; therefore it does not present water or soil contamination potential. Prevent spreading through waterways and sewers.

**Personal precautions:** Isolate the area. Keep unnecessary people away. Do not smoke. Eliminate all ignition sources (open flame, sparks). Avoid electrostatic charges.

**Cleanup methods:** Small spillages: Let evaporate.  
Large spillages: Dilute vapours with water spray and let evaporate.

**Personal protection:** Self-contained breathing apparatus in presence of high vapours concentration. Polyvinyl Chloride gloves. Antistatic safety footwear. Safety shut goggles.

## 7. HANDLING AND STORAGE

### Handling:

*General precautions:* Avoid contact with skin, eyes and clothes. Do not inhale vapours. Good local exhaust ventilation in confined areas (according to legislation in force). Keep away from ignition sources (flames, sparks). Do not smoke in areas where the product is handled. Avoid static charges formation. Ground and bond all lines and equipment.

*Specific conditions:* In cylinder filling operations or handling of containers, use appropriate impervious suits and antistatic footwear; it is recommended in this operations to wear goggles or security mask to avoid possible splashes. Working spark-resistant equipment and tools. Qualified personal and special existing safety manuals and codes should be used during bulk loading, cleaning and maintaining tanks or containers (tanks must be empty before any inspection by trained personal is carried out). Empty containers are as dangerous as full containers, due to highly flammable vapours kept inside.

*Specific Use:* Combustible.

### Storage:

*Temperature and decomposition products:* NP

*Dangerous reactions:* Extremely flammable/combustible product. The liquid has a marked tendency to build up static charge when transferred by pipelines.

*Storage conditions:* Keep the product in properly sealed and labelled containers in cool and well-ventilated place. Keep them away from heat and sources of ignition. Keep them away from strong oxidants. Gas detectors are recommended.

*Incompatible materials:* Oxidants agents.

## 8.EXPOSURE CONTROLS/PERSONAL PROTECTION

### Personal protection:

*Eye protection:* Safety shut goggles. Eye-wash fountains. .

*Respiratory protection:* Respiratory protective mask in presence of vapours or self-contained breathing apparatus at high concentrations.

*Skin protection:* Polyvinyl Chloride gloves. Antistatic safety footwear resistant to chemical products.

*Other protective equipment:* Showers in the work area.

**General precautions:** Avoid liquefied product contact and gas inhalation. Contaminated clothing must be quickly wet to avoid frostbite and possible inflammation. Remove wet clothes if they are not adhered to the skin.

**Specific hygiene measures:** Do not smoke, drink or eat in areas where liquefied product is stored or handled. Care should be taken to ensure proper skin cleaning by washing thoroughly with soap and water, followed by the application of a skin re-conditioning cream.

### Exposure controls:

They are difficult to detect in air by odour, when not odourized.

#### Butane:

TLV/TWA (ACGIH): 1000 ppm

REL/TWA (NIOSH): 800 ppm

MAK: 1000 ppm

#### Propane:

TLV/TWA (ACGIH): 1000 ppm

REL/TWA (NIOSH): 1000 ppm

PEL/TWA (OSHA): 1000 ppm

MAK: 1000 ppm

IDLH (Immediately Dangerous to Life and Health): 2100 ppm.

Propylene:TLV/TWA (ACGIH)/VLA (INSHT): 1000 ppm

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** Liquefied gas.

**pH:** NP

**Colour:** Colourless.

**Odour:** Characteristic, reinforced by sulphur derivatives

**Boiling point:** - 42.2 °C - -11.6 °C

**Melting/Freezing point:**

-183.89 °C

**Flash point:**

-135 °C

**Autoignition temperature:** >400 °C (>752°F)

**Explosive properties:** Lower explosive limit: 1.5%  
Upper explosive limit: 9 %

**Oxidizing properties:** NP

**Vapour pressure:** 2.1 – 8.4 atm

**Density:**

--

**Surface tension:** 15 dynes/cm at 0 °C (liquefied gas)

**Viscosity:**

**Vapour density:** 1.5 - 2 depending on the ratio C<sub>3</sub> / C<sub>4</sub> (air: 1)

**Partition coefficient (n-octanol/water):** log K<sub>octanol/water</sub>: 2.36 - 2.89

**Water solubility:** Insoluble.

**Solubility:** Petroleum solvents.

**Other data:**

--

## 10. STABILITY AND REACTIVITY

**Stability:** Stable under normal conditions. Extremely flammable and combustible.

**Conditions to avoid:** Exposure to flames, heat, sparks and static electricity. Exposure to air.

**Materials to avoid:** Oxidants agents.

**Hazardous decomposition/combustion products:** CO<sub>2</sub>, H<sub>2</sub>O, CO (in incomplete combustion).

**Polymerizations risk:** In presence of olefinic and acetylenic products (ethyl and vinyl acetylene).

**Conditions to avoid:** High temperatures.

## 11. TOXICOLOGICAL INFORMATION

**Routes of exposure:** Inhalation is the most frequent route of exposure. Contact with skin and eyes.

**Acute and chronic effects:** The product is a simple asphyxiant due to oxygen removal from air. May cause harmful central nervous system effects. Liquefied gas or cold vapours may produce burns and frostbite.

LC<sub>50</sub> (butane): 658 g/m<sup>3</sup>/4h (inhalation-rat) - 27.7% vol. in air.

**Carcinogenicity:** No carcinogenic effects registered.

**Reproductive toxicity:** This product has no known mammalian reproductive toxicity.

**Medical conditions which increase hazard to exposure:** Avoid the use of epinephrine and other sympathomimetic amines.

## 12. ECOLOGICAL INFORMATION

### Pollutant potential:

*Persistence and degradability:* The product is expected to exist entirely in the vapour phase in ambient air. Biodegradation may occur in soil and water; however, volatilization is expected to be the main fate process. The volatilization half-life from a model river and a model pond has been estimated to be 2.2 h and 2.6 days, respectively. Reaction with hydroxyl radicals (average half-life of 6 days) and night-time reactions with radical species and nitrogen oxides may contribute to the atmospheric transformation of the product.

*Mobility/bioaccumulative potential:* The product has a low to medium mobility in soil. The bioconcentration factor (log BCF) has been estimated to range from 1.78 to 1.97 suggesting bioconcentration is not an important factor in aquatic systems.

**Ecotoxicological effects:** No ecotoxicity data available. Physical properties indicate that the product will rapidly volatilize from the aquatic environment. The combustion of gasoline is a major mechanism for the release of product into the atmosphere.

## 13. DISPOSAL CONSIDERATIONS

**Disposal methods (surplus):** Due to high evaporation and commercial uses of LPG, there is seldom necessity to dispose of them.

### Waste:

*Disposal:* NP

*Handling:* NP

*Provisions:* Companies that recover, dispose, store, transport or handle waste should comply with local and/or national provisions in force on waste management.

## 14. TRANSPORT INFORMATION

**Special precautions:** Labelled as flammable gas. Transport in passenger aircrafts is forbidden and in passenger vessels is limited.

### Additional Information:

#### LAND TRANSPORT:

Proper shipping name :	PETROLEUM GASES, LIQUEFIED
UN Number :	1075
Hazard class :	Class 2.1
Hazard identification number :	23
Packing group :	NP
Exempt amount :	333 Kg

#### AIR TRANSPORT (ICAO/IATA) :

Proper shipping name :	PETROLEUM GASES, LIQUEFIED
UN Number :	1075
Hazard class :	Class 2.1
Packing group :	NP
CRE :	10L
Passenger and cargo aircraft :	Prohibited
Cargo aircraft only :	Int: 200 / Net Qty: 150 Kg

#### MARITIME TRANSPORT (IMDG/IMO) :

Proper shipping name :	PETROLEUM GASES, LIQUEFIED
UN Number :	1075
Hazard class :	Class 2.1
Packing group :	NP
Marine pollutant :	NO
Stowage and segregation :	Category E
Ems :	F-D, S-U

## 15. REGULATORY INFORMATION

### CLASIFICACION: LABELLING

**Symbols:** F+

**Phrases R:** R12: Extremely flammable.

**F+; R12**

**Phrases S:** S9: Keep container in a well-ventilated place

S16: Keep away from sources of ignition - No smoking.

S33: Take precautionary measures against static discharges.

**Other regulations:** The product is listed in TSCA Inventory (EPA)

## 16. OTHER INFORMATION

### Data Bases consulted

EINECS: European Inventory of Existing Commercial Substances.  
TSCA: Toxic Substances Control Act, US Environmental Protection Agency  
HSDB: US National Library of Medicine.  
RTECS: US Dept. of Health & Human Services

### R phrases show in the document:

### Legislation consulted:

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).  
Dir. 67/548/EEC about classification, labelling and packaging of dangerous substances (including amendments and adaptations in force).  
Dir. 1999/45/EC about classification, labelling and packaging of dangerous preparations (including amendments and adaptations in force).  
Dir. 91/689/EEC dangerous waste; Dir. 91/156/EEC waste management.  
Royal Decree 363/95: Regulation about notification of new substances and classification, packaging and labelling of dangerous substances.  
Royal Decree 255/2003: Regulation about classification, packaging and labelling of dangerous preparations.  
European Agreement concerning the international carriage of dangerous goods by road (ADR).  
Regulation on the international transport of dangerous goods on the railway. (RID)  
International maritime code of dangerous goods. (IMDG)  
International Air Transport Association (IATA) regulation pertaining to air shipment.

### Glossary:

CAS: Chemical Abstract Service	VLA-ED: Valor Límite Ambiental – Exposición Diaria
IARC: International Agency for Research on Cancer	VLA-EC: Valor Límite Ambiental – Exposición Corta
ACGIH: American Conference of Governmental Industrial Hygienists.	LD <sub>50</sub> : Lethal Dose Medium
TLV: Threshold Limit Value	LC <sub>50</sub> : Lethal Concentration Medium
TWA: Time Weighted Average	EC <sub>50</sub> : Effective Concentration Medium
STEL: Short-term Exposure Level	IC <sub>50</sub> : Inhibitory Concentration Medium
REL: Recommendable Exposure Limit	BOD: Biological Oxygen Demand.
PEL: Permissible Exposure Limit	NP: Not Pertinent
INSHT: Instituto Nal. de Seguridad e Higiene en el Trabajo	: Changes from the last revision

The information given in this document has been compiled based on the best existing information sources, latest available knowledge and according to the current requirements on classification, packaging and labelling of hazardous substances. It does not imply the information is exhaustive or accurate in all cases. It is the user's responsibility to determine the validity of the information contained in this Material Safety Data Sheet to apply depending on the case.