Polymer Grade Propylene

Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

Date of issue: 02/03/2016 Revision date: 02/15/2016 Supersedes: 02/03/2016 Version: 4.0

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

1.1. Product identifier

Product form	:	Substance
Trade name	:	Polymer Grade Propylene
Chemical name	:	propene, propylene
CAS No	:	115-07-1
Formula	:	C3H6

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

Use of the substance/mixture	:	Use as an intermediate Distribution Formulation Polymer production Use as a fuel Use as a propellant Fuel additives

1.3. Details of the supplier of the safety data sheet

US office:
Braskem S.A.
5100 Westheimer Rd - Suite 495
Houston, 77056 - USA
Tel: 713 255 4747
Fax: 713 255 4740

Manufacturer:
Braskem S.A.
Rua Eteno, 1561
Polo Petroquímico de Camaçari
42810-000 – Camaçari – BA – Brasil
Tel. (55 71) 3413-1111 or 0800-71-5454

Braskem S.A.
BR 386 – Rodovia Tabaí-Canoas, km 419
Via do Contorno, 850
95853-000 – Triunfo – RS – Brasil
Tel. 0800-541-4252

Braskem S.A.
Av. Presidente Costa e Silva, 1178 – Capuava
09270-001 – Santo André – SP – Brasil
Tel. (55 11) 4478-1777

Braskem S.A.
Rua Marumbi, 1001
25221-000 – Duque de Caxias – RJ – Brasil
(55 21) 2187-8812/8813

E-mail:mayla.salmeron@braskem.com

1.4. Emergency telephone number

Emergency number	:	+55 71 3413-1111 +55 11 4478-1777 +55 21 2187-8812

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Simple Asphy	H380
Flam. Gas 1	H220

Compressed gas H280

Full text of H statements: see section 16

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :

GHS02 GHS04

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated
H380 - May displace oxygen and cause rapid suffocation

Precautionary statements (GHS-US) : P210 - Keep away from heat, sparks, open flames, hot surfaces, No smoking. - No smoking
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely
P381 - Eliminate all ignition sources if safe to do so
P403 - Store in a well-ventilated place
P410+P403 - Protect from sunlight. Store in a well-ventilated place

2.3. Other hazards

other hazards which do not result in classification : When mixed with air and exposed to ignition source, can burn in open air or explode if confined. This material can accumulate static charge by flow or agitation and can be ignited by static discharge. May cause frostbite. May explode on heating.

2.4. Unknown acute toxicity (GHS US)

Not applicable.

SECTION 3: Composition/information on ingredients

3.1. Substance

Substance type : Mono-constituent

Name	Product identifier	%	GHS-US classification
propene, propylene (Main constituent)	(CAS No) 115-07-1	99.5	Simple Asphy, H380 Flam. Gas 1, H220 Compressed gas, H280

Full text of H-statements: see section 16

3.2. Mixture

Not applicable

4.1. Description of first aid measures

First-aid measures general : Do not rub the skin and eyes after direct contact with the product. Avoid any direct contact with the product. Seek medical advice.

First-aid measures after inhalation : Move the affected person away from the contaminated area and into the fresh air. If not breathing, give artificial respiration. Keep victim warm and rested. Seek medical attention immediately.

First-aid measures after skin contact : May cause frostbite. DO NOT attempt to remove the frozen clothing from the skin since removal could result in severe tissue damage. Clothing frozen to the skin should be thawed before being removed. Thaw frosted parts with lukewarm water. Do not rub affected area. Remove the victim away from contaminated area. Put victim at rest, cover with a blanket and keep warm. Remove clothing and jewellery that can restrict circulation. Seek medical attention immediately.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Ensure adequate flushing of eyes by separating eyelids with the fingers. If eyelids are bonded closed release eyelashes with warm water by covering the eye with a wet pad. Do not force eyelids open. Seek medical attention immediately.

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

Symptoms/injuries : Fatigue. Decrease of vision. High concentration of vapours may induce: headache, nausea, dizziness. Vomiting. Asphyxiant in high concentrations. May cause frostbite.

Symptoms/injuries after inhalation : Asphyxiant in high concentrations. High concentration of vapours may induce: headache, dizziness, drowsiness, nausea and vomiting.

Symptoms/injuries after skin contact : May cause frostbite.

Symptoms/injuries after eye contact : May cause frostbite.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : carbon dioxide (CO_2), dry chemical powder, foam. For large fire : Water fog.

Unsuitable extinguishing media : Do not use a water jet since it may cause the fire to spread. Do not aim water directly at point where compressed gas is escaping, as the water may freeze. Do not extinguish flame due to possibility of explosive reignition.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Extremely flammable gas. Vapours are heavier than air and may travel considerable distance to an ignition source and flash back to source of vapours. Explosive when mixed with oxidizing substances. Fight fire with normal precautions from a reasonable distance. Prolonged exposure to fire may cause containers to rupture/explode. Heavier than air, vapours may travel long distances along ground, ignite and flash back to source. May cause frostbite. Asphyxiant in high concentrations. Hazardous combustion products. On combustion forms: Carbon dioxide. Carbon monoxide.

Explosion hazard : Vapours are heavier than air and may travel considerable distance to an ignition source and flash back to source of vapours. Reacts violently with oxidizing substances. Prolonged exposure to fire may cause containers to rupture/explode.

Reactivity : May form an explosive mixture in the presence of air. Explosive when mixed with oxidizing substances. Reacts violently with acids. Explosion risk in case of fire. Lithium nitrate and sulphur dioxide: the resulting mixtures may polymerize explosively. Will explode on mixing with trimethyl hypofluorite in the absence of a diluent, such as nitrogen.

5.3. Advice for firefighters

Firefighting instructions : Cool down the containers exposed to heat with a water spray. Wear proper protective equipment. Prolonged exposure to fire may cause containers to rupture/explode. Spray from a distance to keep far away from any possible explosion. In case of fire: stop leak if safe to do so.

Protective equipment for firefighters : Complete protective clothing. Wear a self contained breathing apparatus. For further information refer to section 8: Exposure-controls/personal protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Boots. Gloves. Self contained breathing apparatus. For further information refer to section 8: Exposure-controls/personal protection.

Emergency procedures : Avoid ignition sources. No smoking. Eliminate all ignition sources if safe to do so. Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Boots. Gloves. Complete protective clothing. In case of fire: Wear self-contained breathing apparatus. For further information refer to section 8: Exposure-controls/personal protection.

Emergency procedures : Eliminate all ignition sources if safe to do so. Evacuate unnecessary personnel. Risk of suffocation due to oxygen deficiency in confined areas. Ventilate area.

6.2. Environmental precautions

Adsorption on activated charcoal. Avoid discharge to the environment. Do not discharge into surface water.

6.3. Methods and material for containment and cleaning up

For containment : Adsorption on activated charcoal.

Methods for cleaning up : Incineration. Adsorption on activated charcoal. Mechanically ventilate the spillage area.

6.4. Reference to other sections

For further information refer to section 8: Exposure-controls/personal protection. For disposal of residues refer to section 13: Disposal considerations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Avoid all unnecessary exposure. Avoid inhalation of the product. Wear recommended personal protective equipment. Keep container closed when not in use. Containers must be properly grounded before beginning transfer. Cool the receiving container before transfer and ensure it is able to support the transfer operation at very low temperatures. Open and close cylinder valves at least once per day to avoid freezing. Have fire-fighting and leak stopping equipment readily available.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practices.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Store in tightly closed, properly ventilated containers away from heat, sparks, open flame. Store in dry, cool, well-ventilated area. Protect containers against damage. Proper grounding procedures to avoid static electricity should be followed. Use only non-sparking tools. Use only explosion-proof equipment. Have fire-fighting and leak stopping equipment readily available. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Provide local exhaust or general room ventilation.

Storage conditions : Do not store near oxidizing agents. Keep container closed when not in use. Keep away from open flames, hot surfaces and sources of ignition. Keep out of direct sunlight. Protect containers against damage. Underground storage. Put the cylinders underground and store them under soil level.

Incompatible materials : Air. Water. Strong oxidizing agents. Acids. Vapours. Lithium nitrate and sulphur dioxide: the resulting mixtures may polymerize explosively. Trimethyl hypofluorite.

Storage area : Keep away from heat and direct sunlight. Keep away from open flames, hot surfaces and sources of ignition. Keep only in the original container in a cool well ventilated place. Provide for an automatic sprinkler system.

7.3. Specific end use(s)

Refer to section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Polymer Grade Propylene **Propylene chemical grade (115-07-1)**		
ACGIH	ACGIH TWA (ppm)	500 ppm
ACGIH	Remark (ACGIH)	Asphyxia; URT irr

8.2. Exposure controls

Appropriate engineering controls : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Handle in accordance with good industrial hygiene and safety procedures. Local exhaust and general room ventilation are both essential to prevent accumulation of flammable vapour. Use explosion-proof equipment. Exhaust ventilation systems should be directly to the outside. Supply sufficient replacement air to compensate the air removed by exhaust systems.

Hand protection : Protective gloves made of PVC.

Eye protection : Chemical goggles or face shield with safety glasses.

Skin and body protection : Boots. PVC apron covering the tops of the boots. Use chemically protective clothing.

Respiratory protection : An approved organic vapour respirator/supplied air or self-contained breathing apparatus must be used when vapour concentration exceeds applicable exposure limits.

Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Molecular mass : 42.08 g/mol

Colour : Colourless

Odour : Odourless

Odour threshold : No data available

pH : Not applicable

Relative evaporation rate (butyl acetate=1) : Not applicable

Melting point : -185.25 °C

Freezing point : No data available

Boiling point : -47.7 °C

Flash point : -107.8 °C Closed cup

Auto-ignition temperature : 455 °C

Decomposition temperature : 91.6 °C

Flammability (solid, gas) : Flammable

Vapour pressure	:	1043 kPa (10.3 atm) at 21.1ºC
Relative vapour density at 20 °C	:	1.48 (20ºC)
Relative density	:	No data available
Density	:	0.07 (Liquid at boiling point)
Solubility	:	Water: Slightly soluble
Log Pow	:	1.77
Log Kow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	2 - 11 vol %

9.2. Other information

Gas group : Compressed gas

SECTION 10: Stability and reactivity

10.1. Reactivity

May form an explosive mixture in the presence of air. Explosive when mixed with oxidizing substances. Reacts violently with acids. Explosion risk in case of fire. Lithium nitrate and sulphur dioxide: the resulting mixtures may polymerize explosively. Will explode on mixing with trimethyl hypofluorite in the absence of a diluent, such as nitrogen.

10.2. Chemical stability

Stable at ambient temperature and under normal conditions of use.

10.3. Possibility of hazardous reactions

In contact with air, may generate explosive peroxides or unstable polymers which may detonate or ignite spontaneously. Vapours may form explosive mixture with air. Keep away from any possible contact with water, because of violent reaction and possible flash fire. Hazardous polymerization may occur if exposure to fire conditions. Attacks some forms of plastics, rubber, and coatings.

10.4. Conditions to avoid

Direct sunlight. Keep away from open flames, hot surfaces and sources of ignition. Air. Incompatible materials. Temperatures higher than 50°C or less than -29°C. Excessive humidity. . insufficient ventilation.

10.5. Incompatible materials

Air. Water. Oxidizing agent. Acids. Attacks some forms of plastics, rubber, and coatings. Lithium nitrate and sulphur dioxide: the resulting mixtures may polymerize explosively. Will explode on mixing with trimethyl hypofluorite in the absence of a diluent, such as nitrogen.

10.6. Hazardous decomposition products

Carbon dioxide. Carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	Not classified
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

Polymer Grade Propylene Propylene chemical grade (115-07-1)	
IARC group	3 - Not classifiable

Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified

Potential Adverse human health effects and symptoms	:	Asphyxiant in high concentrations. Depression of the central nervous system, headaches, dizziness, drowsiness, loss of coordination. Contact with the liquid may cause cold burns/frostbite.
Symptoms/injuries after inhalation	:	Asphyxiant in high concentrations. High concentration of vapours may induce: headache, dizziness, drowsiness, nausea and vomiting.
Symptoms/injuries after skin contact	:	May cause frostbite.
Symptoms/injuries after eye contact	:	May cause frostbite.

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.

12.2. Persistence and degradability

Polymer Grade Propylene Propylene chemical grade (115-07-1)	
Persistence and degradability	Readily biodegradable.

12.3. Bioaccumulative potential

Polymer Grade Propylene Propylene chemical grade (115-07-1)	
Log Pow	1.77
Bioaccumulative potential	Low bioaccumulation potential.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on ozone layer	:	No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods	:	Incineration. Disposal must be done according to official regulations. Adsorption on activated charcoal.
Waste disposal recommendations	:	Disposal must be done according to official regulations.

SECTION 14: Transport information

Classification for LAND transport: DOT

UN Number	:	UN1077
Proper Shipping Name	:	Propylene
Class / Division	:	2.1
Packing group	:	Not applicable
Reportable quantity	:	Not applicable

Classification for SEA transport: IMO - IMDG

UN Number	:	UN1077
Proper Shipping Name	:	PROPYLENE
Class / Division	:	2.1
Packing group	:	Not applicable
Marine pollutant	:	Product considered marine pollutant based on available data
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code:		
Product name	:	Propylene

Classification for AIR transport: IATA - ICAO

UN Number	: UN1077
Proper Shipping Name	: Propylene
Class / Division	: 2.1
Packing group	: Not applicable

This information does not intend to convey all specific regulatory or operational requirements/information relating to the product, therefore it cannot be considered exhaustive. Consult US DOT, IMO and ICAO regulations before transporting the product. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15: Regulatory information

15.1. US Federal regulations

Polymer Grade Propylene **Propylene chemical grade (115-07-1)**	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1.0 %

15.2. International regulations

CANADA

Polymer Grade Propylene **Propylene chemical grade (115-07-1)**	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas

EU-Regulations

Polymer Grade Propylene **Propylene chemical grade (115-07-1)**
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Polymer Grade Propylene **Propylene chemical grade (115-07-1)**
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 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 INSQ (Mexican national Inventory of Chemical Substances) Listed on CICR (Turkish Inventory and Control of Chemicals)

15.3. US State regulations

No additional information available

SECTION 16: Other information

Indication of changes	: Physical and chemical properties.
Revision date	: 02/03/2016
Sources of Key data	: Data arise from reference works and literature.
Abbreviations and acronyms	: ACGIH - American Conference of Government Industrial Hygienists IARC - International Agency for Research on Cancer irr - irritation TWA – Time-weighted average URT – upper respiratory tract

Full text of H-statements:

------	H220	Extremely flammable gas
------	H280	Contains gas under pressure; may explode if heated
------	H380	May displace oxygen and cause rapid suffocation

Braskem - SDS US

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. It warns that the handling of any chemical substance requires the previous knowledge of its hazards for the user. It is up to the user of the product company providing this SDS to and promote the training of its employees about possible risks come upon of the product. The information contained herein is not absolute, but only general information on the use of the chemical and indication of safety and security measures.