SAFETY DATA SHEET
According to EC No 1907/2006 as amended as at the date of this SDS

Propylene - Refinery Grade

Version	Revision Date:	SDS Number:	Date of last issue: 29.03.2023
2.2	12.02.2024	800001033997	Print Date 19.02.2024

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

1.1 Product identifier

Trade name	:	Propylene - Refinery Grade
Product code	:	X2123, X2191, X2195, X2196, X5003, X5006, X5007
Registration number EU	:	01-2119447103-50-0010, 01-2119447103-50-0012, 01-2119447103-50-0013, 01-2119447103-50-0014, 01-2119447103-50-0015, 01-2119447103-50-0142
Synonyms	:	Mixture of propene/propane
CAS-No.	:	115-07-1

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

Use of the Substance/Mixture	:	Base chemical., Raw material for use in the chemical industry. Please refer to section 16 and/or the annexes for the registered uses under REACH.
Uses advised against	:	This product must not be used in applications other than the above without first seeking the advice of the supplier.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier	:	**Shell Chemicals Europe B.V.** PO Box 2334 3000 CH Rotterdam Netherlands
Telephone	:	+31 (0)10 441 5137 / +31 (0)10 441 5191
Telefax	:	+31 (0)20 716 8316 / +31 (0)20 713 9230
Contact for Safety Data Sheet	:	sccmsds@shell.com

1.4 Emergency telephone number

+44 (0) 1235 239 670
National Poison Information Centre (NVIC): Tel. nr. +31(0)88 755 8000 (24 hrs a day and 7 days a week).
Only for the purpose of informing medical personnel.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable gases, Category 1A	H220: Extremely flammable gas.
Gases under pressure, Compressed gas	H280: Contains gas under pressure; may explode if heated.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements :

PHYSICAL HAZARDS:
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.
HEALTH HAZARDS:
Not classified as a health hazard under CLP criteria.
ENVIRONMENTAL HAZARDS:
Not classified as environmental hazard according to CLP criteria.

Precautionary statements :

Prevention:

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P243 Take action to prevent static discharges.

Response:

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 In case of leakage, eliminate all ignition sources.

Storage:

P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Disposal:

No precautionary phrases.

2.3 Other hazards

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

High gas concentrations will displace available air; unconsciousness and death may occur suddenly from lack of oxygen.
Vapours may cause drowsiness and dizziness.
Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.
Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition

sources causing a flashback fire danger.
May form flammable/explosive vapour-air mixture.
This material is shipped under pressure.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical nature : This product may contain trace levels of Naturally Occurring Radioactive Materials (NORM) as Radon 222 (CAS No. 14859-67-7) and its decay products Lead 210 (CAS No. 14255-04-0) and Polonium 210 (CAS No. 13981-52-7). Refer to Sections 7 and 11 for additional information.

Components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)
propylene	115-07-1 204-062-1	50 - 70
propane	74-98-6 200-827-9	30 - 50

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Not expected to be a health hazard when used under normal conditions.

Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.

If inhaled : Call emergency number for your location / facility.
Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or Cardio-Pulmonary Resuscitation as required and transport to the nearest medical facility.

In case of skin contact : Slowly warm the exposed area by rinsing with warm water. Transport to the nearest medical facility for additional treatment.

In case of eye contact : Slowly warm the exposed area by rinsing with warm water. Transport to the nearest medical facility for additional treatment.

If swallowed : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.
Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, lightheadedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death.

Rapid release of gases which are liquids under pressure may cause frost burns of exposed tissues (skin, eye) due to evaporative cooling.

No specific hazards under normal use conditions.
Ingestion may result in nausea, vomiting and/or diarrhoea.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : IMMEDIATE TREATMENT IS EXTREMELY IMPORTANT!
Artificial respiration and/or oxygen may be necessary.
Call a doctor or poison control center for guidance.
Treat symptomatically.
Potential for cardiac sensitisation, particularly in abuse situations. Hypoxia or negative inotropes may enhance these effects. Consider: oxygen therapy.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Shut off supply. If not possible and no risk to surroundings, let the fire burn itself out.

Unsuitable extinguishing media : Do not use water in a jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Sustained fire attack on vessels may result in a Boiling Liquid Expanding Vapor Explosion (BLEVE).
The vapour is heavier than air, spreads along the ground and distant ignition is possible.
Contents are under pressure and can explode when exposed to heat or flames.
As the vapours become lighter than air, the vapours may reach ignition sources at ground or elevated locations.

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).
Specific extinguishing methods	:	Standard procedure for chemical fires.
Further information	:	Clear fire area of all non-emergency personnel. Keep adjacent containers cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Observe the relevant local and international regulations Risk of explosion. Inform the emergency services if liquid enters surface water drains. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained. 6.1.1 For non emergency personnel: Avoid contact with skin, eyes and clothing. Isolate hazard area and deny entry to unnecessary or unprotected personnel. Do not breathe fumes, vapour. Do not operate electrical equipment. 6.1.2 For emergency responders: Avoid contact with skin, eyes and clothing. Isolate hazard area and deny entry to unnecessary or unprotected personnel. Do not breathe fumes, vapour. Do not operate electrical equipment.

6.2 Environmental precautions

Environmental precautions	:	Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area and evacuate all personnel. Attempt to disperse the gas or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Monitor area with combustible gas meter.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	Allow to evaporate. Attempt to disperse the vapour or to direct its flow to a safe

location, for example by using fog sprays. Otherwise treat as for small spillage.

6.4 Reference to other sections

For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet., Risk of explosion. Inform the emergency services if liquid enters surface water drains., For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet., Vapour may form an explosive mixture with air.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures	:	Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Advice on safe handling	:	Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Avoid inhaling vapour and/or mists. Avoid contact with skin, eyes and clothing. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Bulk storage tanks should be diked (bunded). Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur. Be aware of handling operations that may give rise to additional hazards that result from the accumulation of static charges. These include but are not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements. These activities may lead to static discharge e.g. spark formation. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/s until fill pipe submerged to twice its diameter, then ≤ 7 m/s). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations. The vapour is heavier than air. Beware of accumulation in pits and confined spaces.

Radon-222 decay products may accumulate in processing equipment (e.g., pumps, filters, piping, etc.) to a point where gamma radiation is detected outside of this equipment during normal operations. This equipment may contain internal surface deposits of radioactive radon decay products. Equipment should be checked externally while in service for gamma radiation above background levels, and internally prior to maintenance work requiring opening or entry to the equipment, and prior to disposal. Equipment emitting gamma radiation should be presumed to be internally contaminated with alpha-emitting decay products (i.e., Lead-210, Polonium-210). Equipment and piping should be checked for possible decontamination prior to maintenance or disposal. Protective equipment (e.g., disposable coveralls, gloves (rubber/leather), and a respirator with HEPA or P100 filters, or supplied air) should be worn and good personal hygiene practices should be followed by personnel entering a vessel or working on contaminated process equipment to prevent skin contamination, ingestion, or inhalation of any NORM contaminated residue.

Product Transfer : Refer to guidance under Handling section.

Hygiene measures : Wash hands before eating, drinking, smoking and using the toilet. Launder contaminated clothing before re-use.

7.2 Conditions for safe storage, including any incompatibilities

Further information on storage stability : Keep away from aerosols, flammables, oxidizing agents, corrosives and from products harmful or toxic to man or to the environment.
Must be stored in a diked (bunded) well- ventilated area, away from sunlight, ignition sources and other sources of heat.
Vapours from tanks should not be released to atmosphere.
Breathing losses during storage should be controlled by a suitable vapour treatment system.
Electrostatic charges will be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk.
The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable.

Packaging material : Suitable material: For containers, or container linings use mild steel, stainless steel.

Container Advice : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

7.3 Specific end use(s)

Specific use(s) : Please refer to section 16 and/or the annexes for the regis-

tered uses under REACH.

Ensure that all local regulations regarding handling and storage facilities are followed.
See additional references that provide safe handling practices for liquids that are determined to be static accumulators: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity).
IEC/TS 60079-32-1: Electrostatic hazards, guidance

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Biological occupational exposure limits

No biological limit allocated.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Remarks:	No DNEL value has been established.

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
Remarks:	Exposure assessments have not been presented for the environment therefore PNEC values not required.	

8.2 Exposure controls

Engineering measures

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex.
Use sealed systems as far as possible.
Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.
Local exhaust ventilation is recommended.
Firewater monitors and deluge systems are recommended.
The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:

General Information:
Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Purge system prior to equipment break-in or maintenance.

Personal protective equipment

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex. The provided information is made in consideration of the PPE directive (Council Directive 89/686/EEC) and the CEN European Committee for Standardisation (CEN) standards.

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Eye protection	:	Wear goggles for use against liquids and gas, combined with face shield with chin guard. Approved to EU Standard EN166.
Hand protection		
Remarks	:	Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. Neoprene rubber. If contact with liquefied product is possible or anticipated, gloves should be thermally insulated to prevent cold burns. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
Skin and body protection	:	Chemical and cryogenic gloves/gauntlets, boots, and apron. Wear antistatic and flame-retardant clothing.
Respiratory protection	:	If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined

space) use appropriate positive pressure breathing apparatus.
If air-filtering respirators are suitable for conditions of use:
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.

Select a filter suitable for combined particulate/organic gases and vapours [Type AX/Type P boiling point < 65°C (149°F)] meeting EN14387 and EN143.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	Liquid under pressure.
Colour	:	colourless
Odour	:	Faint
Odour Threshold	:	Typical 67 ppm
	:	Data not available
Boiling point/boiling range	:	-44,7 °C
Flammability		
Flammability (solid, gas)	:	Extremely flammable.
Lower explosion limit and upper explosion limit / flammability limit		
Upper explosion limit / upper flammability limit	:	11 %(V)
Lower explosion limit / Lower flammability limit	:	2 %(V)
Flash point	:	-108 °C
Auto-ignition temperature	:	455 °C
Decomposition temperature		
Decomposition temperature	:	Data not available
pH	:	Not applicable
Viscosity		
Viscosity, dynamic	:	0,01 mPa.s (0 °C) Method: ASTM D445

Viscosity, kinematic	:	Data not available
Solubility(ies)		
Water solubility	:	260 mg/l (40 °C) 380 mg/l (22 °C) 930 mg/l (0 °C)
Partition coefficient: n-octanol/water	:	log Pow: 1,77
Vapour pressure	:	600 kPa (0 °C)
Relative density	:	0,58 (32,0 °F) Method: ASTM D4052
Density	:	610 kg/m3 (0 °C) Method: ASTM D4052
Relative vapour density	:	1,5 (0 °C)
Particle characteristics		
Particle size	:	Data not available

9.2 Other information

Explosive properties	:	no data available
Oxidizing properties	:	Data not available
Evaporation rate	:	Data not available
Conductivity	:	Low conductivity: < 100 pS/m, The conductivity of this material makes it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10,000 pS/m., Whether a liquid is nonconductive or semiconductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid
Surface tension	:	Data not available
Molecular weight	:	42 g/mol

SECTION 10: Stability and reactivity

10.1 Reactivity

The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.

10.2 Chemical stability

Stable under normal conditions of use.

10.3 Possibility of hazardous reactions

Hazardous reactions : Reacts violently with strong oxidising agents.
Polymerisation may occur at elevated temperatures.

10.4 Conditions to avoid

Conditions to avoid : Heat, flames, and sparks.
Exposure to air.
In certain circumstances product can ignite due to static electricity.

10.5 Incompatible materials

Materials to avoid : Strong oxidising agents.

10.6 Hazardous decomposition products

Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Information on likely routes of exposure : Inhalation is the primary route of exposure.

Acute toxicity

Components:

propylene:

Acute oral toxicity : Remarks: Not applicable

Acute inhalation toxicity : LC50 (Rat): > 20 mg/l
Exposure time: 4 h
Test atmosphere: gas
Remarks: Low toxicity by inhalation.
High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.

Acute dermal toxicity : Remarks: Not applicable

Skin corrosion/irritation

Components:

propylene:
Remarks : Not irritating to skin.

Serious eye damage/eye irritation

Components:

propylene:
Remarks : Not irritating to eye.

Respiratory or skin sensitisation

Components:

propylene:
Remarks : Not a sensitiser.
Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Components:

propylene:
Genotoxicity in vivo : Remarks: Non mutagenic

Germ cell mutagenicity- Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Carcinogenicity

Components:

propylene:
Remarks : Not a carcinogen.
Based on available data, the classification criteria are not met.

Carcinogenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Material	GHS/CLP Carcinogenicity Classification
propylene	No carcinogenicity classification.
propane	No carcinogenicity classification.

Material	Other Carcinogenicity Classification
propylene	IARC: Group 3: Not classifiable as to its carcinogenicity to humans

Reproductive toxicity

Components:

propylene:

Effects on fertility : Remarks: Does not impair fertility., Not a developmental toxicant.

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

STOT - single exposure

Components:

propylene:

Remarks : Not a respiratory irritant

STOT - repeated exposure

Components:

propylene:

Remarks : Low systemic toxicity on repeated exposure.

Aspiration toxicity

Components:

propylene:

Not an aspiration hazard., Based on available data, the classification criteria are not met.

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Further information

Product:

Remarks : This product may contain trace amounts of NORM as Radon and its decay products.
Carcinogenicity: IARC classification / Group 1 carcinogen.

Radon rapidly decays to form other radioactive elements including lead 210, polonium 210, and bismuth 210. Therefore, processing equipment may contain build-up of radioactive contamination. The radon decay products are solids and therefore may attach to dust particles or form films in equipment. Inhalation, ingestion, or skin contact with radon decay products can lead to the deposit of radioactive material in the respiratory tract, bone or blood forming organs, intestinal tract, and kidney, which may lead to certain cancers.

Remarks : Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Components:

propylene:

Remarks : High gas concentrations will displace available air; unconsciousness and death may occur suddenly from lack of oxygen.
Rapid release of gases which are liquids under pressure may cause frost burns of exposed tissues (skin, eye) due to evaporative cooling.
Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest.

Remarks : Classifications by other authorities under varying regulatory frameworks may exist.

SECTION 12: Ecological information

12.1 Toxicity

Components:

propylene:

Toxicity to fish : Remarks: Based on available data, the classification criteria are not met.

Toxicity to daphnia and other aquatic invertebrates : Remarks: Based on available data, the classification criteria are not met.

Toxicity to algae/aquatic plants	:	Remarks: Based on available data, the classification criteria are not met.
Toxicity to microorganisms	:	Remarks: Based on available data, the classification criteria are not met.
Toxicity to fish (Chronic toxicity)	:	Remarks: Based on available data, the classification criteria are not met.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: Based on available data, the classification criteria are not met.

12.2 Persistence and degradability

Product:

Biodegradability	:	Remarks: Inherently biodegradable. Oxidises rapidly by photo-chemical reactions in air. Not Persistent per IMO criteria. International Oil Pollution Compensation (IOPC) Fund definition: "A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

Components:

propylene:

Biodegradability	:	Remarks: Inherently biodegradable. Oxidises rapidly by photo-chemical reactions in air. Not Persistent per IMO criteria. International Oil Pollution Compensation (IOPC) Fund definition: "A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

12.3 Bioaccumulative potential

Components:

propylene:

Bioaccumulation	:	Remarks: Does not bioaccumulate significantly.

12.4 Mobility in soil

Components:

propylene:

Mobility : Remarks: Because of their extreme volatility, air is the only environmental compartment that hydrocarbon gases will be found.

12.5 Results of PBT and vPvB assessment

Components:

propylene:

Assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB..

12.6 Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product:

Additional ecological information : Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Components:

propylene:

Additional ecological information : Physical properties indicate that hydrocarbon gases will rapidly volatilise from the aquatic environment and that acute and chronic effects would not be observed in practice.
In view of the high rate of loss from solution, the product is unlikely to pose a significant hazard to aquatic life.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Recover or recycle if possible.
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.

Do not dispose into the environment, in drains or in water courses.
Waste product should not be allowed to contaminate soil or water.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.

MARPOL - see International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which provides technical aspects at controlling pollutions from ships.

Contaminated packaging : Data not available

SECTION 14: Transport information

14.1 UN number or ID number

ADN : 1077

ADR : 1077

RID : 1077

IMDG : 1077

IATA : 1077

14.2 UN proper shipping name

ADN : PROPYLENE

ADR : PROPYLENE

RID : PROPYLENE

IMDG : PROPYLENE

IATA : PROPYLENE

14.3 Transport hazard class(es)

ADN : 2

ADR : 2

RID : 2

IMDG : 2.1

IATA : 2.1

14.4 Packing group

ADN

Packing group : Not Assigned

Classification Code : 2F

Labels : 2.1

CDNI Inland Water Waste Agreement : NST 3303 Propylene

ADR

Packing group	:	Not assigned by regulation
Classification Code	:	2F
Hazard Identification Number	:	23
Labels	:	2.1

RID

Packing group	:	Not assigned by regulation
Classification Code	:	2F
Hazard Identification Number	:	23
Labels	:	2.1

IMDG

Packing group	:	Not assigned by regulation
Labels	:	2.1

IATA

Packing group	:	Not Assigned
Labels	:	2.1

14.5 Environmental hazards

ADN
Environmentally hazardous : no

ADR
Environmentally hazardous : no

RID
Environmentally hazardous : no

IMDG
Marine pollutant : no

14.6 Special precautions for user

Remarks : Special Precautions: Refer to Section 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

14.7 Maritime transport in bulk according to IMO instruments

Ship type : 2G/2PG
Product name : Propylene

Additional Information **:** Transport in bulk according to the IGC code This product may be transported under nitrogen blanketing. Nitrogen is an odourless and invisible gas. Exposure to nitrogen enriched atmospheres displaces available oxygen which may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a confined space entry.

SECTION 15: Regulatory information

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

REACH - List of substances subject to authorisation (Annex XIV) : Product is not subject to Authorisation under REACH.

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	18	Liquefied flammable gases (including LPG) and natural gas

Other regulations:

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Product is subject to Major accident risk decision 2015 (BRZO+) based on Seveso III directive (2012/18/EU).

The components of this product are reported in the following inventories:

TSCA	:	Listed
AIIC	:	Listed
DSL	:	Listed
IECSC	:	Listed
ENCS	:	Listed
KECI	:	Listed
NZIoC	:	Listed
PICCS	:	Listed
TCSI	:	Listed

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Training advice	:	Provide adequate information, instruction and training for operators.
Other information	:	For Industry guidance and tools on REACH please visit the CEFIC website at http://cefic.org/Industry-support. The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB. A vertical bar (|) in the left margin indicates an amendment from the previous version.
Sources of key data used to	:	The quoted data are from, but not limited to, one or more

compile the Safety Data Sheet	sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc).

Classification of the mixture:		**Classification procedure:**
Flam. Gas 1A	H220	On basis of test data.
Press. Gas Compr. Gas	H280	On basis of test data.

Identified Uses according to the Use Descriptor System

Uses - Worker
Title : Manufacture of substance
- Industrial

Uses - Worker
Title : Use as an intermediate
- Industrial

Uses - Worker
Title : Distribution of substance
- Industrial

Uses - Worker
Title : Polymer production
- Industrial

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

NL / EN

Exposure Scenario - Worker

300000010077	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Manufacture of substance- Industrial
Use Descriptor	**Sector of Use**: SU3, SU8, SU9 **Process Categories**: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 **Environmental Release Categories**: ERC1, ERC4
Scope of process	Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented.	
Contributing Scenarios	**Risk Management Measures**
General measures (Flammable gas)	Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the ATEX Directive 2014/34/EU and its subsequent updates. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No smoking. Handle in well-ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations.

	Review Safety Data Sheet for additional advice.
Section 2.2	**Control of Environmental Exposure**
Not applicable.	
Frequency and Duration of Use	
Not applicable.	
Environmental factors not influenced by risk management	
Not applicable.	
Other Operational Conditions affecting Environmental Exposure	
Not applicable.	
Technical conditions and measures at process level (source) to prevent release	
Not applicable.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Not applicable.	
Organisational measures to prevent/limit release from site	
Not applicable.	
Conditions and Measures related to municipal sewage treatment plant	
Not applicable.	
Conditions and Measures related to external treatment of waste for disposal	
Not applicable.	
Conditions and measures related to external recovery of waste	
Not applicable.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
Risk Management Measures are based on qualitative risk characterisation.	

Section 3.2 -Environment
Not applicable.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Not applicable.	

Section 4.2 -Environment
Not applicable.

Exposure Scenario - Worker

300000010079	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Use as an intermediate- Industrial
Use Descriptor	**Sector of Use**: SU3, SU8, SU9 **Process Categories**: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 **Environmental Release Categories**: ERC6a
Scope of process	Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented.	
Contributing Scenarios	**Risk Management Measures**
General measures (Flammable gas)	Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the ATEX Directive 2014/34/EU and its subsequent updates. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No smoking. Handle in well-ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations.

	Review Safety Data Sheet for additional advice.
Section 2.2	**Control of Environmental Exposure**
Not applicable.	
Frequency and Duration of Use	
Not applicable.	
Environmental factors not influenced by risk management	
Not applicable.	
Other Operational Conditions affecting Environmental Exposure	
Not applicable.	
Technical conditions and measures at process level (source) to prevent release	
Not applicable.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Not applicable.	
Organisational measures to prevent/limit release from site	
Not applicable.	
Conditions and Measures related to municipal sewage treatment plant	
Not applicable.	
Conditions and Measures related to external treatment of waste for disposal	
Not applicable.	
Conditions and measures related to external recovery of waste	
Not applicable.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
Risk Management Measures are based on qualitative risk characterisation.	

Section 3.2 -Environment
Not applicable.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Not applicable.	

Section 4.2 -Environment
Not applicable.

Exposure Scenario - Worker

300000010078	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Distribution of substance- Industrial
Use Descriptor	**Sector of Use**: SU3, SU8, SU9 **Process Categories**: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC15 **Environmental Release Categories**: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7
Scope of process	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented.	
Contributing Scenarios	**Risk Management Measures**
General measures (Flammable gas)	Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the ATEX Directive 2014/34/EU and its subsequent updates. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No smoking. Handle in well-ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations.

	Review Safety Data Sheet for additional advice.
Section 2.2	**Control of Environmental Exposure**
Not applicable.	
Frequency and Duration of Use	
Not applicable.	
Environmental factors not influenced by risk management	
Not applicable.	
Other Operational Conditions affecting Environmental Exposure	
Not applicable.	
Technical conditions and measures at process level (source) to prevent release	
Not applicable.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Not applicable.	
Organisational measures to prevent/limit release from site	
Not applicable.	
Conditions and Measures related to municipal sewage treatment plant	
Not applicable.	
Conditions and Measures related to external treatment of waste for disposal	
Not applicable.	
Conditions and measures related to external recovery of waste	
Not applicable.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
Risk Management Measures are based on qualitative risk characterisation.	

Section 3.2 -Environment
Not applicable.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Not applicable.	

Section 4.2 -Environment
Not applicable.

Exposure Scenario - Worker

300000010080	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Polymer production- Industrial
Use Descriptor	**Sector of Use**: SU3, SU10 **Process Categories**: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC14 **Environmental Release Categories**: ERC6c
Scope of process	Manufacture of polymers from monomers in continuous and batch processes. Including production, re-cycling and recovery, degassing, discharging, reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation, product off-gassing).

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented.	
Contributing Scenarios	**Risk Management Measures**
General measures (Flammable gas)	Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the ATEX Directive 2014/34/EU and its subsequent updates. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No smoking. Handle in well-ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations.

	Review Safety Data Sheet for additional advice.
Section 2.2	**Control of Environmental Exposure**
Not applicable.	
Frequency and Duration of Use	
Not applicable.	
Environmental factors not influenced by risk management	
Not applicable.	
Other Operational Conditions affecting Environmental Exposure	
Not applicable.	
Technical conditions and measures at process level (source) to prevent release	
Not applicable.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Not applicable.	
Organisational measures to prevent/limit release from site	
Not applicable.	
Conditions and Measures related to municipal sewage treatment plant	
Not applicable.	
Conditions and Measures related to external treatment of waste for disposal	
Not applicable.	
Conditions and measures related to external recovery of waste	
Not applicable.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
Risk Management Measures are based on qualitative risk characterisation.	

Section 3.2 -Environment
Not applicable.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Not applicable.	

Section 4.2 -Environment
Not applicable.