

**Propylene (Polymer Grade, Unodorized)**

Version 2.4

Revision Date 2017-03-06

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

Product Name : Propylene (Polymer Grade, Unodorized)
Material : 1103433, 1102933, 1021731, 1015413, 1026827, 1029232

EC-No.Registration number

Chemical name	CAS-No. EC-No. Index No.	Legal Entity Registration number
Propylene	115-07-1 204-062-1 601-011-00-9	Chevron Phillips Chemical Company LP 01-2119447103-50-0019

Relevant Identified Uses : Manufacture
Supported Distribution
Use as an intermediate
Formulation
Use in polymer production – industrial
Use as a fuel - industrial
Use as a fuel – professional
Use as a fuel – consumer
Use as a propellant – industrial
Use as a propellant – professional
Use as a propellant – consumer

Company : Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Local : Chevron Phillips Chemicals International N.V.
Airport Plaza (Stockholm Building)
Leonardo Da Vincilaan 19
1831 Diegem
Belgium

SDS Requests: (800) 852-5530
Technical Information: (832) 813-4862
Responsible Party: Product Safety Group
Email:sds@cpchem.com

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

Emergency telephone:**Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

Transport:

CHEMTREC 800.424.9300 or 703.527.3887(int'l)

Asia: +800 CHEMCALL (+800 2436 2255) China: +86-21-22157316

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Mexico CHEMTREC 01-800-681-9531 (24 hours)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Responsible Department : Product Safety and Toxicology Group

E-mail address : SDS@CPChem.com

Website : www.CPChem.com

SECTION 2: Hazards identification**Classification of the substance or mixture
REGULATION (EC) No 1272/2008**

Flammable gases, Category 1

H220:

Extremely flammable gas.

Label elements**Labeling (REGULATION (EC) No 1272/2008)**

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H220 Extremely flammable gas.

Precautionary Statements : **Prevention:**
 P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Response:
 P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
 P381 Eliminate all ignition sources if safe to do so.

Storage:
 P403 Store in a well-ventilated place.

SECTION 3: Composition/information on ingredients

Synonyms : Propylene

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

Molecular formula : C₃H₆**Mixtures****Hazardous ingredients**

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
Propylene	115-07-1 204-062-1 601-011-00-9	Flam. Gas 1; H220 Press. Gas Compr. Gas; H280	99
Propane	74-98-6 200-827-9 601-003-00-5	Flam. Gas 1; H220 Press. Gas Liquefied gas; H280 Press. Gas Compr. Gas; H280	1

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

- General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance.
- If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
- In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

SECTION 5: Firefighting measures

- Flash point : -108 °C (-162 °F)
- Autoignition temperature : 497,2 °C (927,0 °F)
- Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO₂). Dry chemical.
- Unsuitable extinguishing media : High volume water jet.
- Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.
- Further information : For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
- Fire and explosion : Do not spray on an open flame or any other incandescent

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

protection material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Hazardous decomposition products : Carbon oxides.

SECTION 6: Accidental release measures

Personal precautions : Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental precautions : Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

SECTION 7: Handling and storage**Handling**

Advice on safe handling : For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers : Prevent unauthorized access. No smoking. Keep in a well-ventilated place. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection**Ingredients with workplace control parameters****SI**

Sestavine	Osnova	Vrednost	Parametri nadzora	Pripomba
Propane	SI OEL	MV	1.000 ppm, 1.800 mg/m3	

SE

Bestandsdelar	Grundval	Värde	Kontrollparametrar	Anmärkning
Propylene	SE AFS	NGV	500 ppm, 900 mg/m3	

RO

Componente	Bază	Valoare	Parametri de control	Notă
Propane	RO OEL	TWA	778 ppm, 1.400 mg/m3	

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

	RO OEL	STEL	1.000 ppm, 1.800 mg/m3	
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PT

Componentes	Bases	Valor	Parâmetros de controlo	Nota
Propylene	PT OEL	VLE-MP	500 ppm,	A4, irritação do TRS,

A4 Agente não classificável como carcinogénico no Homem.
irritação do trato respiratório superior
TRS

PL

Składniki	Podstawa	Wartość	Parametry dotyczące kontroli	Uwaga
Propylene	PL NDS	NDS	2.000 mg/m3	
	PL NDS	NDSch	8.600 mg/m3	
Propane	PL NDS	NDS	1.800 mg/m3	

NO

Komponenter	Grunnlag	Verdi	Kontrollparametrer	Nota
Propane	FOR-2011-12-06-1358	TWA	500 ppm, 900 mg/m3	

LV

Sastāvdaļas	Bāze	Vērtība	Pārvaldības parametri	Piezīme
Propylene	LV OEL	AER 8 st	100 mg/m3	
Propane	LV OEL	AER 8 st	100 mg/m3	
	LV OEL	AER īslaicīgā	300 mg/m3	
	LV OEL	AER 8 st	1.000 ppm, 1.800 mg/m3	

LT

Komponentai	Pagrindas, bazė	Vertė	Kontrolės parametrai	Pastaba
Propylene	LT OEL	IPRD	500 ppm, 900 mg/m3	

IE

Ingredients	Basis	Value	Control parameters	Note
Propylene	IE OEL	OELV - 8 hrs (TWA)	500 ppm,	Asphx,
Propane	IE OEL	OELV - 8 hrs (TWA)	1.000 ppm,	Asphx,

Asphx Gaseous chemical substances which may not produce significant physiological effects in the exposed employee, but when present in high concentrations will act as simple asphyxiants

GR

Συστατικά	Βάση	Τιμή	Παράμετροι ελέγχου	Σημείωση
Propane	GR OEL	TWA	1.000 ppm, 1.800 mg/m3	

FI

Aineosat	Peruste	Arvo	Valvontaa koskevat muuttujat	Huomautus
Propane	FI OEL	HTP-arvot 8h	800 ppm, 1.500 mg/m3	Liite 4,
	FI OEL	HTP-arvot 15 min	1.100 ppm, 2.000 mg/m3	Liite 4,

Liite 4 Happea syrjäyttämällä tukehduttavat kaasut

ES

Componentes	Base	Valor	Parâmetros de control	Nota
Propylene	ES VLA	VLA-ED	500 ppm,	
Propane	ES VLA	VLA-ED	1.000 ppm,	

EE

Komponendid, osad	Alused	Väärtus	Kontrolliparameetrid	Märkused
Propane	EE OEL	Piinorm	1.000 ppm, 1.800 mg/m3	

DK

Komponenter	Basis	Værdi	Kontrolparametre	Note
Propylene	DK OEL	GV	100 ppm, 172 mg/m3	
Propane	DK OEL	GV	1.000 ppm, 1.800 mg/m3	

DE

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Propane	DE TRGS 900	AGW	1.000 ppm, 1.800 mg/m3	DFG,

DFG Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission)

CH

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Propylene	CH SUVA	MAK-Wert	10.000 ppm, 17.500 mg/m3	
Propane	CH SUVA	MAK-Wert	1.000 ppm, 1.800 mg/m3	NIOSH,

SDS Number:100000010916

5/25

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

	CH SUVA	KZGW	4.000 ppm, 7.200 mg/m3	NIOSH,
NIOSH National Institute for Occupational Safety and Health				

BG

Съставки	Основа	Стойност	Параметри на контрол	Бележка
Propane	BG OEL	TWA	1.800 mg/m3	

BE

Bestanddelen	Basis	Waarde	Controleparameters	Opmerking
Propane	BE OEL	TGG 8 hr	1.000 ppm,	
	BE OEL	TGG 8 hr	1.000 ppm,	gas

AT

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Propane	AT OEL	TMW	1.000 ppm, 1.800 mg/m3	
	AT OEL	KZW	2.000 ppm, 3.600 mg/m3	

Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection : Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Full-Face Supplied-Air Respirator.

Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Eye wash bottle with pure water. Safety glasses.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate: Lightweight protective clothing. Flame retardant protective clothing. Footwear protecting against chemicals.

Hygiene measures : Wash hands before breaks and at the end of workday.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 9: Physical and chemical properties**Information on basic physical and chemical properties****Appearance**

Physical state : Gaseous

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

Color : Colorless

Odor : Sweet

Safety data

Flash point : -108 °C (-162 °F)

Lower explosion limit : 2 %(V)

Upper explosion limit : 10 %(V)

Oxidizing properties : No

Autoignition temperature : 497,2 °C (927,0 °F)

Molecular formula : C₃H₆

Molecular weight : 42,09 g/mol

pH : No data available

Freezing point : -185 °C (-301 °F)

Boiling point/boiling range : -47,8 °C (-54,0 °F)

Vapor pressure : 226,40 PSI
at 37,8 °C (100,0 °F)
Method: ReidRelative density : 0,52
at 15,6 °C (60,1 °F)

Water solubility : Soluble in hydrocarbon solvents; partially soluble in water.

Partition coefficient: n-octanol/water : No data available

Viscosity, kinematic : No data available

Relative vapor density : 1,5
(Air = 1.0)

Evaporation rate : No data available

SECTION 10: Stability and reactivity

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Conditions to avoid : Heat, flames and sparks.

Materials to avoid : May react with oxygen and strong oxidizing agents, such as

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

Hazardous decomposition products : chlorates, nitrates, peroxides, etc.
: Carbon oxides

Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information**Propylene (Polymer Grade, Unodorized)**

Acute oral toxicity : Negligible or unlikely exposure pathways

Acute inhalation toxicity

Propylene : LC50: > 86 mg/l
Exposure time: 4 h
Species: Rat
Test atmosphere: gas
Test substance: yes

Propane : LC50: > 800000 ppm
Exposure time: 15 min
Species: Rat
Test atmosphere: gas

Propylene (Polymer Grade, Unodorized)

Acute dermal toxicity : Negligible or unlikely exposure pathways

Propylene (Polymer Grade, Unodorized)

Skin irritation : No adverse effects expected.

Propylene (Polymer Grade, Unodorized)

Eye irritation : No adverse effects expected.

Propylene (Polymer Grade, Unodorized)

Sensitization : This information is not available.

Repeated dose toxicity

Propylene : Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 625,1250,2500,5000, 10000 ppm
Exposure time: 14 wk
Number of exposures: 6 Hr/d, 5 d/wk
NOEL: 10000 ppm
No adverse effect has been observed in chronic toxicity tests.

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

Species: Mouse, Male and female
 Sex: Male and female
 Application Route: Inhalation
 Dose: 625,1250,2500,5000, 10000 ppm
 Exposure time: 14 wk
 Number of exposures: 6 Hr/d, 5 d/wk
 NOEL: 10000 ppm
 No adverse effect has been observed in chronic toxicity tests.

Species: Rat, Male and female
 Sex: Male and female
 Application Route: Inhalation
 Dose: 0, 5000, 10000 ppm
 Exposure time: 103 wk
 Number of exposures: 6 Hr/d, 5 d/wk
 Lowest observable effect level: 5000 ppm

Species: Mouse, Male and female
 Sex: Male and female
 Application Route: Inhalation
 Dose: 0, 5000, 10000 ppm
 Exposure time: 103 wk
 Number of exposures: 6 Hr/d, 5 d/wk
 Lowest observable effect level: 5000 ppm

Propane

Species: Monkey
 Application Route: Inhalation
 Dose: 0, 750 ppm
 Exposure time: 90 day
 Number of exposures: daily
 NOEL: > 750 ppm

Carcinogenicity**Propylene**

: Species: Rat
 Dose: 0, 5000, 10000 ppm
 Exposure time: 103 wks
 Number of exposures: 6 h/d, 5 d/wk
 Remarks: No evidence of carcinogenicity

Species: Mouse
 Dose: 0, 5000, 10000 ppm
 Exposure time: 103 wks
 Number of exposures: 6 h/d, 5 d/wk
 Remarks: No evidence of carcinogenicity

Reproductive toxicity**Propylene**

: Species: Rat
 Sex: male and female
 Application Route: Inhalation
 Dose: 0, 5000, 10000 ppm
 Number of exposures: 6 hrs/d, 5 d/wk
 Test period: 103 wks
 NOAEL Parent: 10000 ppm

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

Propane

Species: Mouse
 Sex: male and female
 Application Route: Inhalation
 Dose: 0, 5000, 10000 ppm
 Number of exposures: 6 hrs/d, 5 d/wk
 Test period: 103 wks
 NOAEL Parent: 10000 ppm

Species: Rat
 Sex: male and female
 Application Route: Inhalation
 Dose: 0, 1200, 4000, 12000 ppm
 Exposure time: 6 weeks
 Number of exposures: 6 hours/day, 7 days/week
 Test period: 6 weeks
 Test substance: yes
 Method: OECD Guideline 422
 NOAEL Parent: 12000 ppm
 NOAEL F1: 12000 ppm

Developmental Toxicity**Propylene**

: Species: Rat
 Application Route: Inhalation
 Dose: 0, 200, 1000, 10000 ppm
 Number of exposures: 6 hrs/d
 Test period: 14 d
 Method: OECD Guideline 414
 NOAEL Teratogenicity: 10000 ppm
 NOAEL Maternal: 10000 pmm

Propylene (Polymer Grade, Unodorized)**Aspiration toxicity**

: No aspiration toxicity classification.

CMR effects**Propylene**

: Carcinogenicity: Animal testing did not show any carcinogenic effects.
 Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
 Teratogenicity: Animal testing did not show any effects on fetal development.
 Reproductive toxicity: Animal testing did not show any effects on fertility.

Propylene (Polymer Grade, Unodorized)**Further information**

: This product contains NORMS based RADON:
 Carcinogenicity: IARC classification / Group 1 carcinogen
 Other: The amount of radon in the gas itself is not hazardous, but since radon rapidly decays ($t_{1/2}=3.82$ days) to form other radioactive elements including lead 210, polonium 210, and bismuth 210, equipments may contain radioactivity. The radon decay products are solids and therefore may attach to dust particles or form films in equipment. Inhalation, ingestions, 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. Risks can be minimized by following good

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

industrial and personal hygiene practices noted in section 7.

SECTION 12: Ecological information

Elimination information (persistence and degradability)

Bioaccumulation : This material is not expected to bioaccumulate.

Biodegradability : This material is volatile and is expected to partition to air.

Ecotoxicology Assessment

Results of PBT assessment : This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT)., This mixture contains no substance considered to be very persistent and very bioaccumulating (vPvB).

Additional ecological information : No data available

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product : Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 14: Transport information**The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).**

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)UN1075, PETROLEUM GASES, LIQUEFIED, 2.1
NON- ODORIZED

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN1075, PETROLEUM GASES, LIQUEFIED, 2.1, (-108 °C)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN1075, 2.1: NOT PERMITTED FOR TRANSPORT

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))

UN1075, PETROLEUM GASES, LIQUEFIED, 2.1, (B/D)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))

UN1075, PETROLEUM GASES, LIQUEFIED, 2.1

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)

UN1075, PETROLEUM GASES, LIQUEFIED, 2.1

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

SECTION 15: Regulatory information**National legislation**

Major Accident Hazard Legislation : 96/82/EC Update: 2003
 Extremely flammable
 8
 Quantity 1: 10 t
 Quantity 2: 50 t

Water contaminating class (Germany) : nwg not water endangering
 VwVwS

Notification status

Europe REACH	:	On the inventory, or in compliance with the inventory
United States of America (USA) TSCA	:	On TSCA Inventory
Canada DSL	:	All components of this product are on the Canadian DSL
Australia AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	On the inventory, or in compliance with the inventory
Japan ENCS	:	On the inventory, or in compliance with the inventory
Korea KECI	:	On the inventory, or in compliance with the inventory
Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	On the inventory, or in compliance with the inventory

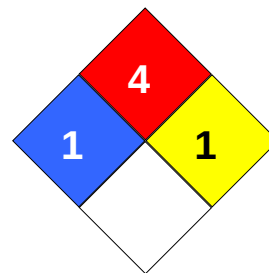
Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

SECTION 16: Other information

NFPA Classification : Health Hazard: 1
Fire Hazard: 4
Reactivity Hazard: 1

**Further information**

Legacy SDS Number : 5349

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

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.

Key or legend to abbreviations and acronyms used in the safety data sheet

ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and	TSCA	Toxic Substance Control Act

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

	New Chemical Substances		
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

Full text of H-Statements referred to under sections 2 and 3.

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

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

Annex**1. Short title of Exposure Scenario: Manufacture**

Main User Groups	:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	SU3, SU8, SU9: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category	:	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities PROC15: Use as laboratory reagent
Further information	:	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

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Use as laboratory reagent

Amount used

Remarks : Not applicable

3. Exposure estimation and reference to its source

Remarks: Not applicable

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

by the Exposure Scenario

Not applicable

1. Short title of Exposure Scenario: Distribution

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU3, SU8, SU9: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities : Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Further information	: 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.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b,, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent

Amount used

Remarks : Not applicable

3. Exposure estimation and reference to its source

Remarks: Not applicable

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable

1. Short title of Exposure Scenario: Use as an intermediate

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU3, SU8, SU9: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Amount used

Remarks : Not applicable

3. Exposure estimation and reference to its source

Remarks: Not applicable

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable

1. Short title of Exposure Scenario: Formulation

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in
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Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

- Sector of use : preparations at industrial sites
SU3, SU8, SU9, SU 10: Industrial Manufacturing (all),
 Manufacture of bulk, large scale chemicals (including
 petroleum products), Manufacture of fine chemicals,
 Formulation [mixing] of preparations and/ or re-packaging
 (excluding alloys)
- Process category : **PROC1:** Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional
 controlled exposure
PROC3: Use in closed batch process (synthesis or
 formulation)
PROC4: Use in batch and other process (synthesis) where
 opportunity for exposure arises
PROC8a: Transfer of substance or preparation
 (charging/discharging) from/to vessels/large containers at
 non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/
 discharging) from/ to vessels/ large containers at dedicated
 facilities
 : Transfer of substance or preparation into small containers
 (dedicated filling line, including weighing)
PROC14: Production of mixtures or articles by tableting,
 compression, extrusion, pelletization; Industrial setting;
PROC15: Use as laboratory reagent
- Further information :
 Formulation, packing and re-packing of the substance and its
 mixtures in batch or continuous operations, including storage,
 materials transfers, mixing, tableting, compression,
 pelletisation, extrusion, large and small scale packing,
 sampling, maintenance and associated laboratory activities.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b,, PROC14, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;, Use as laboratory reagent

Amount used

Remarks : Not applicable

3. Exposure estimation and reference to its source

Remarks: Not applicable

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable

1. Short title of Exposure Scenario: Use in polymer production – industrial

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU3, SU8, SU9: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises : PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC6: Calendering operations PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities PROC14: Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting; PROC21: Low energy manipulation of substances bound in materials and/ or articles
Further information	: Manufacture of polymers from monomers in continuous and batch processes, include sparging, discharging, and reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation, product off-gassing).

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4,, PROC6, PROC8a, PROC8b, PROC14, PROC21: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact), Calendering operations, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;, Low energy manipulation of substances bound in materials and/ or articles

Amount used

SDS Number:100000010916

19/25

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

Remarks : Not applicable

3. Exposure estimation and reference to its source

Remarks: Not applicable

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable

1. Short title of Exposure Scenario: Use as a fuel - industrial

Main User Groups : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites

Sector of use : **SU3:** Industrial Manufacturing (all)

Process category : **PROC1:** Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities
PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

Further information : Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Using material as fuel sources, limited exposure to unburned product to be expected

Amount used

Remarks : Not applicable

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

3. Exposure estimation and reference to its source

Remarks: Not applicable

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable

1. Short title of Exposure Scenario: Use as a fuel – professional

Main User Groups	:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sector of use	:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process category	:	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
Further information	:	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Using material as fuel sources, limited exposure to unburned product to be expected

Amount used

Remarks : Not applicable

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

3. Exposure estimation and reference to its source

Remarks: Not applicable

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable

1. Short title of Exposure Scenario: Use as a fuel – consumer

Main User Groups : **SU 21:** Consumer uses: Private households (= general public = consumers)

Sector of use : **SU 21:** Consumer uses: Private households (= general public = consumers)

Product category : **PC13:** Fuels

Further information : Covers consumer uses in liquid fuels.

2.2 Contributing scenario controlling consumer exposure for: PC13: Fuels**Amount used**

Remarks : Not applicable

3. Exposure estimation and reference to its source

Remarks: Not applicable

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable

1. Short title of Exposure Scenario: Use as a propellant – industrial

Main User Groups : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites

Sector of use : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites

Process category : **PROC7:** Industrial spraying

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

2.2 Contributing scenario controlling worker exposure for: PROC7: Industrial spraying**Amount used**

Remarks : Not applicable

3. Exposure estimation and reference to its source

Remarks: Not applicable

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable

1. Short title of Exposure Scenario: Use as a propellant – professional

Main User Groups : **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Sector of use : **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process category : **PROC3:** Use in closed batch process (synthesis or formulation)
: PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC11: Non industrial spraying
PROC14: Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;

2.2 Contributing scenario controlling worker exposure for: PROC3,,, PROC11, PROC14: Use in closed batch process (synthesis or formulation), PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact), Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Non industrial spraying, Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;

Amount used

Remarks : Not applicable

3. Exposure estimation and reference to its source

Remarks: Not applicable

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable

1. Short title of Exposure Scenario: Use as a propellant – consumer

Main User Groups	:	SU 21: Consumer uses: Private households (= general public = consumers)
Sector of use	:	SU21: Private households (=general public = consumers)
Product category	:	PC1: Adhesives, sealants PC3: Air care products PC4: Anti-Freeze and de-icing products PC8: Biocidal products (e.g. Disinfectants, pest control) PC9a: Coatings and paints, thinners, paint removers PC24: Lubricants, greases, release products PC27: Plant protection products PC28: Perfumes, fragrances PC31: Polishes and wax blends PC35: Washing and cleaning products (including solvent based products) PC39: Cosmetics, personal care products

2.2 Contributing scenario controlling consumer exposure for: PC1, PC3, PC4, PC8, PC9a, PC24, PC27, PC28, PC31, PC35, PC39: Adhesives, sealants, Air care products, Anti-Freeze and de-icing products, Biocidal products (e.g. Disinfectants, pest control), Coatings and paints, thinners, paint removers, Lubricants, greases, release products, Plant protection products, Perfumes, fragrances, Polishes and wax blends, Washing and cleaning products (including solvent based products), Cosmetics, personal care products

Amount used

Remarks : Not applicable

3. Exposure estimation and reference to its source

Remarks: Not applicable

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable

Propylene (Polymer Grade, Unodorized)

Version 2.4

Revision Date 2017-03-06