

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

#### 1.1. Product identifier

Product form	: Substance (UVCB)
Trade name	: Tetramer
Chemical name	: Alkenes, C10-14-branched and linear, C12-rich
IUPAC name	: Alkenes, C10-14-branched and linear, C12-rich
EC-No.	: 298-697-1
CAS-No.	: 93821-12-6
Product code	: P502, P502FL
REACH registration No	: 01-2119489789-08
Product group	: Trade product

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

##### 1.2.1. Relevant identified uses

Industrial/Professional use spec	: Distribution of substance Intermediate Industrial For professional use only
Use of the substance/mixture	: Intermediate Industrial For professional use only

Title	Use descriptors
Use as an intermediate - Industrial (ES Ref.: ES 3)	SU3, SU8, SU9, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15, ERC6a, ESVOC SPERC 6.1a.v1

Full text of use descriptors: see section 16

##### 1.2.2. Uses advised against

No additional information available

#### 1.3. Details of the supplier of the safety data sheet

Supplier (Only Representative):  
 Braskem Netherland BV  
 Weena 238-240, 9th Floor, Tower C  
 NL - 3012 NJ – Rotterdam  
 T +31 10 798 5002  
 productsafety@braskem.com

#### 1.4. Emergency telephone number

Emergency number : CHEMTREC International: +1 703-741-5970

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

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

Flammable liquids, Category 3	H226
Aspiration hazard, Category 1	H304
Hazardous to the aquatic environment – Acute Hazard, Category 1	H400
Hazardous to the aquatic environment – Chronic Hazard, Category 1	H410

Full text of H- and EUH-statements: see section 16

##### Adverse physicochemical, human health and environmental effects

Flammable liquid and vapour. May be fatal if swallowed and enters airways. Very toxic to aquatic life with long lasting effects.

#### 2.2. Label elements

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

Hazard pictograms (CLP)



Signal word (CLP)

: Danger

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Hazard statements (CLP)	: H226 - Flammable liquid and vapour. H304 - May be fatal if swallowed and enters airways. H410 - Very toxic to aquatic life with long lasting effects.
Precautionary statements (CLP)	: P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P273 - Avoid release to the environment. P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor. P331 - Do NOT induce vomiting. P405 - Store locked up. P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.
EUH-statements	: EUH066 - Repeated exposure may cause skin dryness or cracking.

### 2.3. Other hazards

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

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

The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Substance type : UVCB

Name	Product identifier	%
Alkenes, C10-14-branched and linear, C12-rich	CAS-No.: 93821-12-6 EC-No.: 298-697-1 REACH-no: 01-2119489789-08	100

### 3.2. Mixtures

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general	: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
First-aid measures after inhalation	: Allow affected person to breathe fresh air. Allow the victim to rest. If breathing stops, give artificial respiration. Seek medical attention immediately.
First-aid measures after skin contact	: Take off immediately all contaminated clothing. Rinse skin with water/shower. Seek medical attention if ill effect or irritation develops.
First-aid measures after eye contact	: Rinse immediately with plenty of water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persists.
First-aid measures after ingestion	: Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. May result in aspiration into the lungs, causing chemical pneumonia. Rinse mouth. Immediately call a POISON CENTER/doctor.

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

Symptoms/effects after inhalation	: Aspiration of this material may cause chemical pneumonia.
Symptoms/effects after skin contact	: May cause slight irritation to the skin. Prolonged or repeated contact with the skin may cause dermatitis.
Symptoms/effects after eye contact	: May cause slight temporary irritation.
Symptoms/effects after ingestion	: Ingestion may cause nausea and vomiting. May be fatal if swallowed and enters airways. Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. Pulmonary oedema.

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

Treat symptomatically.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media	: Carbon dioxide (CO <sub>2</sub> ), dry chemical powder, foam. Water fog.
Unsuitable extinguishing media	: Do not use a water jet since it may cause the fire to spread. Do not use a heavy water stream.

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### 5.2. Special hazards arising from the substance or mixture

- Fire hazard : Material can accumulate some static charge during transfer. Flammable liquid and vapour. Incomplete combustion releases dangerous carbon monoxide, carbon dioxide and other toxic gases.
- Explosion hazard : May form flammable/explosive vapour-air mixture. Heat may build pressure in tank and containers, rupturing closed vessels, spreading fire and increasing risk of burns and injuries.

### 5.3. Advice for firefighters

- Firefighting instructions : Cool down the containers exposed to heat with a water spray. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire fighting water from entering the environment.
- Protective equipment for firefighters : Do not enter fire area without proper protective equipment, including respiratory protection. For large fire: Use self-contained breathing apparatus and chemically protective clothing. For small fire: Fight fire from safe distance and protected location. For further information refer to section 8: "Exposure controls/personal protection".

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Use non-sparking tools. Remove ignition sources. Use special care to avoid static electric charges. No open flames. No smoking.

#### 6.1.1. For non-emergency personnel

- Protective equipment : Use personal protective equipment as required. For further information refer to section 8: "Exposure controls/personal protection".
- Emergency procedures : Use non-sparking tools. Eliminate every possible source of ignition. Evacuate unnecessary personnel.

#### 6.1.2. For emergency responders

- Protective equipment : Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".
- Emergency procedures : Evacuate unnecessary personnel. Spill should be handled by trained cleaning personnel properly equipped with respiratory and eye protection. Ventilate area.

### 6.2. Environmental precautions

Prevent contamination of soil, drains and surface waters. Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

### 6.3. Methods and material for containment and cleaning up

- For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
- Methods for cleaning up : Take up large spills with pump or vacuum. Use only non-sparking tools. Absorb remaining liquid with sand or inert absorbent and remove to safe place. Consult an expert on waste disposal or treatment. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

### 6.4. Reference to other sections

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

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

- Additional hazards when processed : Handle empty containers with care because residual vapours are flammable.
- Precautions for safe handling : Ground/bond container and receiving equipment. Carry out operations in the open/under local exhaust/ventilation or with respiratory protection. Do not use compressed air to transfer, discharge or transport the product. Provide good ventilation in process area to prevent formation of vapour. No open flames. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

### 7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Ground equipment electrically. Keep away from sources of ignition. Avoid static electricity discharges. Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical, lighting, ventilating equipment.

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Storage conditions : Keep away from ignition sources (including static discharges). Store tightly closed in a dry, cool and well-ventilated place. Keep only in the original container in a cool well ventilated place. Keep container tightly closed.

Incompatible materials : Strong oxidizing agents. Strong acids. Strong bases.

### 7.3. Specific end use(s)

See Section 1.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### 8.1.1 National occupational exposure and biological limit values

No additional information available

#### 8.1.2. Recommended monitoring procedures

No additional information available

#### 8.1.3. Air contaminants formed

No additional information available

#### 8.1.4. DNEL and PNEC

No additional information available

#### 8.1.5. Control banding

No additional information available

### 8.2. Exposure controls

#### 8.2.1. Appropriate engineering controls

##### Appropriate engineering controls:

Local exhaust and general room ventilation are both essential to prevent accumulation of flammable vapour. Use explosion-proof equipment.

#### 8.2.2. Personal protection equipment

##### 8.2.2.1. Eye and face protection

###### Eye protection:

Chemical goggles or face shield with safety glasses

##### 8.2.2.2. Skin protection

###### Skin and body protection:

Wear suitable protective clothing or Rubber apron

###### Hand protection:

Impermeable protective gloves. Do not reuse gloves. It is recommended that the glove supplier be consulted to ensure the protective gloves are resistant to chemicals in this product

Hand protection					
Type	Material	Permeation	Thickness (mm)	Penetration	Standard
Disposable gloves, E.g. KCL Type: 717 or 730 or equivalent	Cloro-pren, or, Nitrile	<480 minutes.	0,65 / 0,4	Not known	EN 374

##### 8.2.2.3. Respiratory protection

###### Respiratory protection:

Approved organic vapour respirator. An approved organic vapour respirator/supplied air or self-contained breathing apparatus must be used when vapour concentration exceeds applicable exposure limits. Consult a national health and safety authority for further guidance

Respiratory protection			
Device	Filter type	Condition	Standard
Full face mask, with cartridge/filter	A	Concentrations exceed max allowed workplace atmospheric concentrations.	EN 14387

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### 8.2.2.4. Thermal hazards

No additional information available

### 8.2.3. Environmental exposure controls

#### Other information:

Do not eat, drink or smoke during use.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Colour	: Colourless.
Odour	: Characteristic. petroleum-like odour.
Odour threshold	: Not available
Melting point	: Not available
Freezing point	: > -80 °C
Boiling point	: 171 – 208 °C
Flammability	: Flammable Flammable liquid and vapour.
Explosive properties	: Not applicable.
Oxidising properties	: Not applicable.
Explosive limits	: 0.8 – 5.4 vol %
Lower explosion limit	: Not available
Upper explosion limit	: Not available
Flash point	: 52 °C (Closed cup)
Auto-ignition temperature	: Not applicable
Decomposition temperature	: Not applicable
pH	: Not applicable
Viscosity, kinematic	: Not available
Solubility	: Soluble in: Benzene. Water: Insoluble Ethanol: Soluble
Partition coefficient n-octanol/water (Log Kow)	: Not available
Partition coefficient n-octanol/water (Log Pow)	: Not available
Vapour pressure	: 20 mm Hg (284 hPa; 19°C)
Vapour pressure at 50°C	: Not available
Density	: 0.77 – 0.785 (20°C)
Relative density	: Not available
Relative vapour density at 20°C	: 5.81 (Air = 1)
Particle characteristics	: Not applicable

### 9.2. Other information

#### 9.2.1. Information with regard to physical hazard classes

Explosion limits : 0.8 – 5.4 vol %

#### 9.2.2. Other safety characteristics

Relative evaporation rate (butylacetate=1) : Not applicable

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No dangerous reactions known under normal conditions of use.

### 10.2. Chemical stability

Stable at room temperature. Flammable liquid and vapour. May form flammable/explosive vapour-air mixture.

### 10.3. Possibility of hazardous reactions

No dangerous reactions known.

### 10.4. Conditions to avoid

Avoid ignition sources. Avoid static electricity discharges. Direct sunlight. Extremely high or low temperatures. Open flame. Overheating. Heat. Sparks.

### 10.5. Incompatible materials

Strong oxidizing agents. Strong acids. Strong bases.

### 10.6. Hazardous decomposition products

Carbon oxides (CO, CO<sub>2</sub>). Hydrocarbons. fume. Carbon monoxide. Carbon dioxide. May release flammable gases.

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### SECTION 11: Toxicological information

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

Acute toxicity (oral)	: Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (dermal)	: Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation)	: Not classified (Based on available data, the classification criteria are not met)

Tetramer (93821-12-6)	
LD50 dermal rat	> 2000 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 402 (Acute Dermal Toxicity), Remarks on results: other:
LD50 dermal rabbit	> 2000 mg/kg bodyweight Animal: rabbit, Guideline: OECD Guideline 402 (Acute Dermal Toxicity)

Skin corrosion/irritation	: Not classified (Based on available data, the classification criteria are not met)
Additional information	: Repeated exposure may cause skin dryness or cracking.
Serious eye damage/irritation	: Not classified (Based on available data, the classification criteria are not met)
Respiratory or skin sensitisation	: Not classified (Based on available data, the classification criteria are not met)
Germ cell mutagenicity	: Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity	: Not classified (Based on available data, the classification criteria are not met)
Reproductive toxicity	: Not classified (Based on available data, the classification criteria are not met)
STOT-single exposure	: Not classified (Based on available data, the classification criteria are not met)
STOT-repeated exposure	: Not classified (Based on available data, the classification criteria are not met)
Aspiration hazard	: May be fatal if swallowed and enters airways.

Tetramer (93821-12-6)	
Viscosity, kinematic	Not available

#### 11.2. Information on other hazards

##### 11.2.1. Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties	: No additional information available
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##### 11.2.2. Other information

Other information	: Likely routes of exposure: ingestion, inhalation, skin and eye
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### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - water	: Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.
Hazardous to the aquatic environment, short-term (acute)	: Very toxic to aquatic life.
Hazardous to the aquatic environment, long-term (chronic)	: Very toxic to aquatic life with long lasting effects.

#### 12.2. Persistence and degradability

Tetramer (93821-12-6)	
Persistence and degradability	This product has little potential to bioaccumulate in aquatic organisms, is expected to rapidly degrade, and is not expected to persist. Will not undergo hydrolysis. May cause long-term adverse effects in the environment.

#### 12.3. Bioaccumulative potential

Tetramer (93821-12-6)	
Partition coefficient n-octanol/water (Log Pow)	Not available
Bioaccumulative potential	Not established.

#### 12.4. Mobility in soil

No additional information available

#### 12.5. Results of PBT and vPvB assessment

Tetramer (93821-12-6)	
Results of PBT assessment	This substance does not meet the criteria for classification as PBT or vPvB.

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### 12.6. Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties : No information available

### 12.7. Other adverse effects

Additional information : Avoid release to the environment.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Regional legislation (waste) : Dispose of contents/container in accordance with licensed collector's sorting instructions. Disposal must be done according to official regulations.

Product/Packaging disposal recommendations : Dispose of this material and its container at hazardous or special waste collection point. Do not allow to enter into surface water or drains. Do not re-use empty containers. Dispose in a safe manner in accordance with local/national regulations.

Additional information : Handle empty containers with care because residual vapours are flammable.

Ecology - waste materials : Avoid release to the environment. Hazardous waste due to toxicity.

## SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
<b>14.1. UN number or ID number</b>				
UN 2850	UN 2850	UN 2850	UN 2850	UN 2850
<b>14.2. UN proper shipping name</b>				
PROPYLENE TETRAMER	PROPYLENE TETRAMER	Propylene tetramer	PROPYLENE TETRAMER	PROPYLENE TETRAMER
<b>Transport document description</b>				
UN 2850 PROPYLENE TETRAMER, 3, III, (D/E), ENVIRONMENTALLY HAZARDOUS	UN 2850 PROPYLENE TETRAMER, 3, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS	UN 2850 Propylene tetramer, 3, III, ENVIRONMENTALLY HAZARDOUS	UN 2850 PROPYLENE TETRAMER, 3, III, ENVIRONMENTALLY HAZARDOUS	UN 2850 PROPYLENE TETRAMER, 3, III, ENVIRONMENTALLY HAZARDOUS
<b>14.3. Transport hazard class(es)</b>				
3	3	3	3	3
<b>14.4. Packing group</b>				
III	III	III	III	III
<b>14.5. Environmental hazards</b>				
Dangerous for the environment: Yes	Dangerous for the environment: Yes Marine pollutant: Yes	Dangerous for the environment: Yes	Dangerous for the environment: Yes	Dangerous for the environment: Yes
No supplementary information available				

### 14.6. Special precautions for user

#### Overland transport

Classification code (ADR) : F1  
Limited quantities (ADR) : 5I  
Excepted quantities (ADR) : E1  
Packing instructions (ADR) : P001, IBC03, LP01, R001  
Mixed packing provisions (ADR) : MP19  
Portable tank and bulk container instructions (ADR) : T2  
Portable tank and bulk container special provisions (ADR) : TP1

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Tank code (ADR) : LGBF  
Vehicle for tank carriage : FL  
Transport category (ADR) : 3  
Special provisions for carriage - Packages (ADR) : V12  
Special provisions for carriage - Operation (ADR) : S2  
Hazard identification number (Kemler No.) : 30  
Orange plates :



Tunnel restriction code (ADR) : D/E

### Transport by sea

Packing instructions (IMDG) : P001, LP01  
IBC packing instructions (IMDG) : IBC03  
Tank instructions (IMDG) : T2  
Tank special provisions (IMDG) : TP2  
EmS-No. (Fire) : F-E  
EmS-No. (Spillage) : S-E  
Stowage category (IMDG) : A  
Properties and observations (IMDG) : Colourless liquid. Immiscible with water. Irritating to skin, eyes and mucous membranes.

### Air transport

PCA Excepted quantities (IATA) : E1  
PCA Limited quantities (IATA) : Y344  
PCA limited quantity max net quantity (IATA) : 10L  
PCA packing instructions (IATA) : 355  
PCA max net quantity (IATA) : 60L  
CAO packing instructions (IATA) : 366  
CAO max net quantity (IATA) : 220L  
ERG code (IATA) : 3L

### Inland waterway transport

Classification code (ADN) : F1  
Limited quantities (ADN) : 5 L  
Excepted quantities (ADN) : E1  
Carriage permitted (ADN) : T  
Equipment required (ADN) : PP, EX, A  
Ventilation (ADN) : VE01  
Number of blue cones/lights (ADN) : 0

### Rail transport

Classification code (RID) : F1  
Limited quantities (RID) : 5L  
Excepted quantities (RID) : E1  
Packing instructions (RID) : P001, IBC03, LP01, R001  
Mixed packing provisions (RID) : MP19  
Portable tank and bulk container instructions (RID) : T2  
Portable tank and bulk container special provisions (RID) : TP1  
Tank codes for RID tanks (RID) : LGBF  
Transport category (RID) : 3  
Special provisions for carriage – Packages (RID) : W12  
Colis express (express parcels) (RID) : CE4  
Hazard identification number (RID) : 30

### 14.7. Maritime transport in bulk according to IMO instruments

Not applicable



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### SECTION 15: Regulatory information

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

##### 15.1.1. EU-Regulations

###### REACH Annex XVII (Restriction List)

Not listed on REACH Annex XVII

###### REACH Annex XIV (Authorisation List)

Not listed on REACH Annex XIV (Authorisation List)

###### REACH Candidate List (SVHC)

Not listed on the REACH Candidate List

###### PIC Regulation (Prior Informed Consent)

Not listed on the PIC list (Regulation EU 649/2012)

###### POP Regulation (Persistent Organic Pollutants)

Not listed on the POP list (Regulation EU 2019/1021)

###### Ozone Regulation (1005/2009)

Not listed on the Ozone Depletion list (Regulation EU 1005/2009)

###### Explosives Precursors Regulation (2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

###### Drug Precursors Regulation (273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

##### 15.1.2. National regulations

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Listed on KECL/KECI (Korean Existing Chemicals Inventory)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on the TCSI (Taiwan Chemical Substance Inventory)

Listed on the NCI (Vietnam - National Chemical Inventory)

##### Germany

Water hazard class (WGK) : WGK 3, Highly hazardous to water (Classification according to VwVwS, Annex 3; ID No. 2272).

Hazardous Incident Ordinance (12. BImSchV) : Is not subject of the Hazardous Incident Ordinance (12. BImSchV)

##### Netherlands

SZW-lijst van kankerverwekkende stoffen : Alkenes, C10-14-branched and linear, C12-rich is listed

SZW-lijst van mutagene stoffen : Alkenes, C10-14-branched and linear, C12-rich is listed

SZW-lijst van reprotoxische stoffen – Borstvoeding : The substance is not listed

SZW-lijst van reprotoxische stoffen –

Vruchtbaarheid

SZW-lijst van reprotoxische stoffen – Ontwikkeling : The substance is not listed

##### Denmark

Class for fire hazard : Class II-1

Store unit : 5 liter

Classification remarks : R10 <H226;H304;H410>; Emergency management guidelines for the storage of flammable liquids must be followed

Danish National Regulations : Young people under 18 years are not allowed to use the product

#### 15.2. Chemical safety assessment

For this substance a chemical safety assessment has been carried out

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### SECTION 16: Other information

Indication of changes			
Section	Changed item	Change	Comments
2.3	Other hazards	Modified	
8.2	Exposure controls	Modified	
11.1	Informaiton on hazard classes as defined in Regulation (EC) No 1272/2008	Modified	
11.2	Informaiotn on other hazards	Added	
12.6	Endocrine disrupting properties	Added	
14	Transporation informaiton	Modified	
15	Regulatory informaiton	Modified	

Sources of Key data : Data arise from reference works and literature.

Other information : None.

Full text of H- and EUH-statements:	
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment – Chronic Hazard, Category 1
Asp. Tox. 1	Aspiration hazard, Category 1
EUH066	Repeated exposure may cause skin dryness or cracking.
Flam. Liq. 3	Flammable liquids, Category 3
H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Full text of use descriptors	
ERC1	Manufacture of the substance
ERC2	Formulation into mixture
ERC3	Formulation into solid matrix
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
ESVOC SPERC 1.1.v1	ESVOC 1 - Manufacture of the substance and subsequent recycling/ recovery, including material transfers, storage, and maintenance
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)
ESVOC SPERC 2.2.v1	Formulation & packing of preparations and mixtures: Industrial (SU10)
ESVOC SPERC 4.20.v1	Polymer production: Industrial (SU10)

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Full text of use descriptors	
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC14	Tabletting, compression, extrusion, pelettisation, granulation
PROC15	Use as laboratory reagent
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC6	Calendering operations
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
SU10	Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU3	Industrial uses: Uses of substances as such or in preparations* at industrial sites
SU8	Manufacture of bulk, large scale chemicals (including petroleum products)
SU9	Manufacture of fine chemicals

Braskem - SDS\_EU (modified 221026)

### Annex to the safety data sheet

Product exposure scenario(s)	
ES Type	ES title
Worker	Use as Intermediate - Industrial

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### 1. Exposure scenario ES 3

#### Use as Intermediate - Industrial

ES Ref.: ES 3

ES Type: Worker

Use descriptors	SU3, SU8, SU9 PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15 ERC6a ESVOC SPERC 6.1a.v1
Processes, tasks, activities covered	Use as an intermediate within closed or contained systems (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Industrial use

### 2. Operational conditions and risk management measures

#### 2.1.1 Contributing scenario controlling worker exposure (PROC1) (General exposures (closed systems))

PROC1	Use in closed process, no likelihood of exposure	
<b>Product characteristics</b>		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure	
Concentration of substance in product	Covers percentage substance in the product up to 100 %.	
<b>Operational conditions</b>		
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
<b>Risk Management Measures</b>		
Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.	
Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified	

#### 2.1.2 Contributing scenario controlling worker exposure (PROC2) (General exposures (closed systems))

PROC2	Use in closed, continuous process with occasional controlled exposure	
<b>Product characteristics</b>		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure	
Concentration of substance in product	Covers percentage substance in the product up to 100 %.	
<b>Operational conditions</b>		
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	

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Risk Management Measures		
Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.	
Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified	
2.1.3 Contributing scenario controlling worker exposure (PROC3) (General exposures (closed systems))		
PROC3	Use in closed batch process (synthesis or formulation)	
Product characteristics		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure	
Concentration of substance in product	Covers percentage substance in the product up to 100 %.	
Operational conditions		
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
Risk Management Measures		
Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.	
Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified	
2.1.4 Contributing scenario controlling worker exposure (PROC4) (General exposures (open systems))		
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises	
Product characteristics		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure	
Concentration of substance in product	Covers percentage substance in the product up to 100 %.	
Operational conditions		
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
Risk Management Measures		
Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.	

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Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified	

### 2.1.5 Contributing scenario controlling worker exposure (PROC8b) (Process sampling)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	
<b>Product characteristics</b>		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure	
Concentration of substance in product	Covers percentage substance in the product up to 100 %.	
<b>Operational conditions</b>		
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
<b>Risk Management Measures</b>		
Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.	
Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified	

### 2.1.6 Contributing scenario controlling worker exposure (PROC15) (Laboratory activities)

PROC15	Use as laboratory reagent	
<b>Product characteristics</b>		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure	
Concentration of substance in product	Covers percentage substance in the product up to 100 %.	
<b>Operational conditions</b>		
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
<b>Risk Management Measures</b>		
Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.	
Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified	

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Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified	

### 2.1.7 Contributing scenario controlling worker exposure (PROC8b) (Bulk transfers)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	
<b>Product characteristics</b>		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure	
Concentration of substance in product	Covers percentage substance in the product up to 100 %.	
<b>Operational conditions</b>		
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
<b>Risk Management Measures</b>		
Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.	
Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified	

### 2.1.8 Contributing scenario controlling worker exposure (PROC8b) (Bulk transfers)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	
<b>Product characteristics</b>		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure	
Concentration of substance in product	Covers percentage substance in the product up to 100 %.	
<b>Operational conditions</b>		
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
<b>Risk Management Measures</b>		
Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.	
Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they	

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	occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified	

### 2.1.9 Contributing scenario controlling worker exposure (PROC8b) (Bulk transfers)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	
<b>Product characteristics</b>		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure	
Concentration of substance in product	Covers percentage substance in the product up to 100 %.	
<b>Operational conditions</b>		
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
<b>Risk Management Measures</b>		
Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.	
Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified	

### 2.1.10 Contributing scenario controlling worker exposure (PROC8a) (Equipment cleaning and maintenance)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	
<b>Product characteristics</b>		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure	
Concentration of substance in product	Covers percentage substance in the product up to 100 %.	
<b>Operational conditions</b>		
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
<b>Risk Management Measures</b>		
Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.	
Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent /	



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	minimise exposures and to report any skin problems that may develop	
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified	

### 2.1.11 Contributing scenario controlling worker exposure (PROC1, PROC2) (Storage)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure

#### Product characteristics

Physical form of product	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure
Concentration of substance in product	Covers percentage substance in the product up to 100 %.

#### Operational conditions

Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.

#### Risk Management Measures

Organisational measures to prevent /limit releases, dispersion and exposure	Do not ingest. If swallowed then seek immediate medical assistance.
Organisational measures to prevent /limit releases, dispersion and exposure	No other specific measures identified
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
Conditions and measures related to personal protection, hygiene and health evaluation	No other specific measures identified

### 2.2 Contributing scenario controlling environmental exposure (ERC6a, ESVOC SPERC 6.1a.v1)

ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)

#### Product characteristics

Physical form of product	Substance is complex UVCB, Predominantly hydrophobic, Readily biodegradable
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#### Operational conditions

Amounts used	Fraction of EU tonnage used in region:	1
Amounts used	Regional use tonnage	1000
Amounts used	Fraction of Regional tonnage used locally:	0.1
Amounts used	Annual site tonnage	100
Amounts used	Maximum daily site tonnage	5000
Frequency and duration of use	Continuous release	
Frequency and duration of use	Emission days	20
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
Environmental factors not influenced by risk management	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0.001
Other given operational conditions affecting environmental exposure	Release fraction to wastewater from process (initial release prior to RMM):	0.00001
Other given operational conditions affecting environmental exposure	Release fraction to soil from process (initial release prior to RMM):	0.001

#### Risk Management Measures

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used
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Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment. No wastewater treatment required	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of	80
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	>= 0
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	>= 0
Organisation measures to prevent/limit release from site	Prevent discharge of undissolved substance to or recover from onsite wastewater	
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils	
Organisation measures to prevent/limit release from site	Sewage sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via municipal sewage treatment	97.2
Conditions and measures related to sewage treatment plant	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	97.2
Conditions and measures related to sewage treatment plant	Maximum allowable site tonnage (MSafe)	180000 (based on domestic sewage treatment release)
Conditions and measures related to sewage treatment plant	Assumed domestic sewage treatment plant flow	2000
Conditions and measures related to external treatment of waste for disposal	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to external recovery of waste	External treatment and disposal of waste should comply with applicable local and/or national regulations	

### 3. Exposure estimation and reference to its source

#### 3.1. Health

Information for contributing exposure scenario	
2.1.1	A quantitative risk assessment is not required for human health.

#### 3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrisk)

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

#### 4.1. Health

Guidance - Health	A quantitative risk assessment is not required for human health.
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#### 4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> )
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This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. It warns that the handling of any chemical substance requires the previous knowledge of its hazards for the user. It is up to the user of the product company providing this SDS to and promote the training of its employees about possible risks come upon of the product. The information contained herein is not absolute, but only general information on the use of the chemical and indication of safety and security measures.