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#### CHEVRON PHILLIPS CHEMICALS INTERNATIONAL N.V.

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July 29, 2016

#### **RE: REACH Compliance : AlphaPlus® 1-hexene**

Dear Customer,

For REACH registrations, Chevron Phillips Chemicals International NV (CPCI) is appointed the Only Representative (OR) to Chevron Phillips Chemical Company LP (CPC). In this position as OR, CPCI has registered the components of the product mentioned above with the European Chemical Agency (ECHA), registration tier 2010.

Please find attached the current Safety Data Sheet that reflects the REACH registration number in Section 1.

We have also attached the Substances of Very High Concern (SVHC) letter which includes the one substance added by ECHA to the existing 168 substances.

For any further questions, please send your query to <u>REACH@cpchem.com</u>.

Sincerely,

Paria del Vilan Ravives

Maria Ramirez, MSc



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June 23, 2016

### RE: Olefins - SVHC, Intended Release

Dear Customer,

Based on current and available information, Olefins do not contain any Substances of Very High Concern (SVHC) as listed on the candidate list published by ECHA as of 20 June 2016. Please find the total list of 169 substances with the inclusion date when they were published by ECHA on the following link: <u>http://echa.europa.eu/candidate-list-table</u>

Our Olefins do not contain substances with intended release.

If you have any further questions, please contact me directly or send your query to <u>REACH@cpchem.com</u>.

Sincerely,

Maria del Pilan Raines

Maria Ramirez, MSc

SAFETY DATA SHEET

## AlphaPlus® 1-Hexene



Version 3.5

Product information Product Name Material EC-No.Registration ne Chemical name 1-Hexene	: AlphaP : 111742 102530 102834 Jmber CAS-No. EC-No. Index No. 592-41-6 209-753-1	lus® 1-Hexene 7, 1088135, 1081271, 1084562, 1066515, 1070002, 8, 1017828, 1032321, 1017829, 1028630, 1026835, 2, 1011442, 1026834, 1015415 Legal Entity Registration number Chevron Phillips Chemical Company LP 01-2119475505-34-0005
Product Name Material EC-No.Registration nu Chemical name 1-Hexene	: AlphaP : 111742 102530 102834 umber CAS-No. EC-No. Index No. 592-41-6 209-753-1	lus® 1-Hexene 7, 1088135, 1081271, 1084562, 1066515, 1070002, 8, 1017828, 1032321, 1017829, 1028630, 1026835, 2, 1011442, 1026834, 1015415 Legal Entity Registration number Chevron Phillips Chemical Company LP 01-2119475505-34-0005
EC-No.Registration nu Chemical name 1-Hexene	umber CAS-No. EC-No. Index No. 592-41-6 209-753-1	Legal Entity Registration number Chevron Phillips Chemical Company LP 01-2119475505-34-0005
Chemical name 1-Hexene	CAS-No. EC-No. Index No. 592-41-6 209-753-1	Legal Entity Registration number Chevron Phillips Chemical Company LP 01-2119475505-34-0005
1-Hexene	592-41-6 209-753-1	Chevron Phillips Chemical Company LP 01-2119475505-34-0005
Relevant Identified Use Supported	s : Manufa Distribu Use as Formul Lubrica Lubrica Lubrica Metal v Metal v Use as Use as Functic Functic Use in	acture ution an intermediate ation unts - Industrial unts - Professional unts - Consumer vorking fluids / rolling oils - Industrial vorking fluids / rolling oils - Professional a fuel - industrial a fuel - professional onal Fluids - Industrial onal Fluids - Professional polymer production – industrial n Phillips Chemical Company LP
Company	Normal 10001 S The Wo	Alpha Olefins (NAO) Six Pines Drive podlands, TX 77380
Local	: Chevro Airport Leonard 1831 D Belgiun SDS Re	n Phillips Chemicals International N.V. Plaza (Stockholm Building) do Da Vincilaan 19 iegem n equests: (800) 852-5530
OS Number:100000068730	0	1/48

Alpha Diug @ 1 Uayana			SAFETY DATA SHEET
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		Responsible Par Email:sds@cpch	y: Product Safety Group em.com
Emergency telephone:			
Health: 866.442.9628 (North Ame 1.832.813.4984 (Internati Transport: CHEMTREC 800.424.930 Asia: +800 CHEMCALL ( EUROPE: BIG +32.14.58 South America SOS-Cote	erica onal 00 o +800 \$454 ec In	a) I) r 703.527.3887(ini 0 2436 2255) Chir 5 (phone) or +32.1 side Brazil: 0800.1	'I) a:+86-21-22157316 4583516 (telefax) I 11.767 Outside Brazil: +55.19.3467.1600
Responsible Department	:	Product Safety a	nd Toxicology Group
Website	:	www.CPChem.co	om
SECTION 2: Hazards identificat	ion		
Classification of the substance REGULATION (EC) No 1272/200	or i 08	mixture	
Flammable liquids, Category	2 י	H225	
Aspiration hazard, Category	1	Highi H304 May	: be fatal if swallowed and enters airways.
Label elements Labeling (REGULATION (E0	C) N	o 1272/2008)	
Hazard pictograms	:		
Signal Word	:	Danger	
Hazard Statements	:	H225 H304	Highly flammable liquid and vapor. May be fatal if swallowed and enters airways.
Precautionary Statements	:	Prevention: P210	Keep away from heat/sparks/open
		P243	Take precautionary measures against static discharge.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
		<b>Response:</b> P301 + P310	IF SWALLOWED: Immediately call a
		P331	Do NOT induce vomiting.
		<b>Storage:</b> P403 + P235	Store in a well-ventilated place. Keep cool.
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Hazardous ingredients which must be listed on the label: • 592-41-6 1-Hexene

SECTION 3: Composition/information on ingredients

Synonyms	: alpha-Hexene Hexene-1 Hex-1-ene Hexylene NAO 6 Butyl Ethylene C6H12	
Molecular formula	: C6H12	

Mixtures

#### Hazardous ingredients

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
1-Hexene	592-41-6 209-753-1	Flam. Liq. 2; H225 Asp. Tox. 1; H304	99 - 100
2-Ethyl-1-Butene	760-21-4 212-078-5	Flam. Liq. 2; H225 STOT SE 3; H336 Asp. Tox. 1; H304	0 - 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. Symptoms of poisoning may appear several hours later. Do not leave the victim unattended.
If inhaled	:	If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	:	If on skin, rinse well with water. If on clothes, remove clothes.
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. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.
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SECTION 5: Firefighting measures	S
Flash point :	-26 °C (-15 °F) Method: closed cup
Autoignition temperature :	272 °C (522 °F)
Suitable extinguishing : media	Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.
Unsuitable extinguishing : media	High volume water jet.
Specific hazards during fire : fighting	Do not allow run-off from fire fighting to enter drains or water courses.
Special protective : equipment for fire-fighters	Wear self-contained breathing apparatus for firefighting if necessary.
Further information :	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. 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 : protection	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.
Hazardous decomposition : products	No data available.
SECTION 6: Accidental release me	easures
Personal precautions :	Use personal protective equipment. 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.
Methods for cleaning up :	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
SECTION 7: Handling and storage	•
Handling	
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	e			
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Advice on safe handling	: Ele coi boi the poi cha coi ga tru Fo 19 Pro Sta (Al Igr	ectrostatic charge may ndition when handling nding and grounding is emselves be sufficient tential to generating a arge and/or a flamma ntainer filling, splash f uging, switch loading, ck operations) and us r more information, re 10.106 "Flammable a ptection Association (la tic Electricity"; and/or PI) Recommended Pr itions Arising Out of S	y accumulate and create this material. To minimi may be necessary, but n . Review all operations, nd accumulation of elec ble atmosphere (includir illing, tank cleaning, sam filtering, mixing, agitatic e appropriate mitigating fer to OSHA Standard 2 nd Combustible Liquids" NFPA 77), "Recommend the American Petroleur actice 2003, "Protection Static, Lightning, and stra	a hazardous ze this hazard, nay not by which have the trostatic ng tank and npling, on, and vacuum procedures. 9 CFR '; National Fire ded Practice on n Institute Against ay Currents".
Advice on protection against fire and explosion	: Do ma dis onl hot	not spray on an oper aterial. Take necessa charge (which might ly explosion-proof equ t surfaces and source	n flame or any other inca ry action to avoid static e cause ignition of organic lipment. Keep away from s of ignition.	indescent electricity vapors). Use m open flames,
Storage				
Requirements for storage areas and containers	: No vei cai Ob ma	smoking. Keep cont ntilated place. Contai refully resealed and k serve label precaution aterials must comply v	ainer tightly closed in a c ners which are opened r ept upright to prevent leans. Electrical installation with the technological sat	dry and well- must be akage. ns / working fety standards.
	ls/person	al protection		
SECTION 8: EXPOSURE CONTROL				
Ingredients with workplac	ce contro	l parameters		
Ingredients with workplace	ce contro	l parameters	Parâmetros de	Nota
PT Componentes	Bases	Valor	Parâmetros de controlo 50 ppm	Nota
PT Componentes 1-Hexene afeção do SNC afeção do sistema nervoso	Bases PT OEL	Valor VLE-MP	Parâmetros de controlo 50 ppm,	Nota afeção do SNC,
PT Componentes 1-Hexene afeção do SNC afeção do sistema nervoso BE	Bases PT OEL o central	Valor VLE-MP	Parâmetros de controlo 50 ppm,	Nota afeção do SNC,
PT Componentes 1-Hexene afeção do SNC afeção do sistema nervoso BE Bestanddelen 1-Hexene	Bases PT OEL central Basis BE OEL	Valor VLE-MP	Parâmetros de controlo 50 ppm, Controleparameters 50 ppm 175 mg/m3	Nota afeção do SNC, Opmerking
PT Componentes 1-Hexene afeção do SNC afeção do sistema nervoso BE Bestanddelen 1-Hexene PNEC	Ce contro Bases PT OEL central Basis BE OEL : F	Valor VLE-MP Waarde TGG 8 hr	Parâmetros de controlo 50 ppm, Controleparameters 50 ppm, 175 mg/m3	Nota afeção do SNC, Opmerking
PT Componentes 1-Hexene afeção do SNC afeção do sistema nervoso BE Bestanddelen 1-Hexene PNEC PNEC	Ce contro Bases PT OEL central Basis BE OEL : F V : S V	Valor VLE-MP Waarde TGG 8 hr resh water falue: 0,111 mg/l ea water falue: 0,111 mg/l	Parâmetros de controlo 50 ppm, Controleparameters 50 ppm, 175 mg/m3	Nota afeção do SNC, Opmerking
PT Componentes 1-Hexene afeção do SNC afeção do sistema nervoso BE Bestanddelen 1-Hexene PNEC PNEC PNEC	Ce contro Bases PT OEL o central Basis BE OEL : F V : S V : F	Valor VLE-MP Waarde TGG 8 hr resh water alue: 0,111 mg/l ea water alue: 0,111 mg/l resh water sediment alue: 19,25 mg/kg	Parâmetros de controlo 50 ppm, Controleparameters 50 ppm, 175 mg/m3	Nota afeção do SNC, Opmerking
PT Componentes 1-Hexene afeção do SNC afeção do sistema nervoso BE Bestanddelen 1-Hexene PNEC PNEC PNEC PNEC PNEC	Ce contro Bases PT OEL Ceentral Basis BE OEL : F V : S V : F V : S V	Valor VLE-MP VLE-MP VLE-MP VLE-MP VLE-MP VLE-MP Valor Valor VLE-MP Valor VLE-MP Valor Valor VLE-MP Valor VLE-MP Valor Val	Parâmetros de controlo 50 ppm, Controleparameters 50 ppm, 175 mg/m3	Nota afeção do SNC, Opmerking
SECTION 8: Exposure control         Ingredients with workplay         PT         Componentes         1-Hexene         afeção do SNC         PREC         PNEC         PNEC         PNEC         PNEC         PNEC         PNEC         PNEC         PNEC         PNEC         PNEC	Ce contro Bases PT OEL central Basis BE OEL : F V : S V : S V : S	Valor VLE-MP	Parâmetros de controlo 50 ppm, Controleparameters 50 ppm, 175 mg/m3	Nota afeção do SNC, Opmerking

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Value: 4,01 mg/kg

#### **Engineering measures**

Adequate ventilation to control airborned 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 supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. 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:. Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
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. Tightly fitting safety goggles.
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:. Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.
For additional details, see the	e Ex	posure Scenario in the Annex portion
<b>SECTION 9: Physical and chem</b>	ical	l properties

 Information on basic physical and chemical properties

 Appearance

 Form
 : Liquid

 Physical state
 : Liquid

 Color
 : Clear, colorless

 Safety data
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sion 3.5		Revision Date 2016-05
Flash point	: -26 °C (-15 °F) Method: closed cup	
Lower explosion limit	: 2 %(V)	
Upper explosion limit	: 7 %(V)	
Oxidizing properties	: no	
Autoignition temperature	: 272 °C (522 °F)	
Thermal decomposition	: No data available	
Molecular formula	: C6H12	
Molecular weight	: 84,18 g/mol	
рН	: Not applicable	
Pour point	: No data available	
Boiling point/boiling range	: 63,5 °C (146,3 °F)	
Vapor pressure	: 176,00 MMHG at 24 °C (75 °F)	
	106,30 kPa at  65 °C (149 °F)	
Relative density	: 0,68 at 15 °C (59 °F)	
Density	: 645 kg/m3 at 50 °C (122 °F)	
	678 kg/m3 at 15 °C (59 °F)	
	674 g/cm3 at 20 °C (68 °F)	
Water solubility	: 47 MG/L at 20 °C (68 °F) slightly soluble	
Partition coefficient: n-	: log Pow: 3,87	
Viscosity, kinematic	: 0,34 cSt at 40 °C (104 °F)	
Relative vapor density	: 2,9 (Air = 1.0)	
Evaporation rate	: No data available	
Percent volatile	: >99 %	
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Other information				
Conductivity	: 4,1 pSm Method: ASTM D4308			
SECTION 10: Stability and reactivit	:y			
Chemical stability :	<ul> <li>This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.</li> </ul>			
Possibility of hazardous reaction	Possibility of hazardous reactions			
Conditions to avoid	Heat, flames and sparks.			
Thermal decomposition	No data available			
Hazardous decomposition products	: No data available			
Other data	: No decomposition if stored and applied as directed.			
SECTION 11: Toxicological informa	ation			
Acute oral toxicity				
1-Hexene :	: LD50: > 5.600 mg/kg Species: Rat Sex: male and female Method: Fixed Dose Method			
Acute inhalation toxicity				
1-Hexene :	: LC50: 110,1 mg/l Exposure time: 4 h Species: Rat Sex: male Test atmosphere: vapor Method: OECD Test Guideline 403			
Skin irritation				
1-Hexene :	No skin irritation Repeated or prolonged contact with the mixture may cause removal of natural fat from the skin resulting in desiccation of the skin.			
Eye irritation 1-Hexene	No eye irritation			
AlphaPlus® 1-Hexene				
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Sensitization	: Did not cause sensitization on laboratory animals.
Repeated dose toxicity	
1-Hexene	<ul> <li>Species: Rat, male Sex: male</li> <li>Application Route: oral gavage</li> <li>Dose: 0, 10, 101, 1010, 3365 mg/kg</li> <li>Exposure time: 28 day</li> <li>Number of exposures: daily</li> <li>NOEL: 101 mg/kg</li> <li>Lowest observable effect level: 1.010 mg/kg</li> <li>Test substance: yes</li> <li>Method: OECD Test Guideline 407</li> </ul>
	Species: Rat, female Sex: female Application Route: oral gavage Dose: 0, 10, 101, 1010, 3365 mg/kg Exposure time: 28 day Number of exposures: daily NOEL: 1.010 mg/kg Lowest observable effect level: 3.365 mg/kg Test substance: yes Method: OECD Test Guideline 407
	Species: Rat Application Route: Inhalation Dose: 0, 300, 1000, 3000 ppm Exposure time: 90 day Number of exposures: 6 h/d, 5 d/wk, 13 wk NOEL: 3000 ppm Test substance: yes
Reproductive toxicity	
1-Hexene	: Species: Rat Sex: males Application Route: oral gavage Dose: 0, 100, 500, 1000 mg/kg Number of exposures: daily Test period: 44 d Test substance: yes Method: OECD Guideline 421 NOAEL Parent: 1.000 mg/kg NOAEL F1: 1.000 mg/kg
	Species: Rat Sex: females Application Route: oral gavage Dose: 0, 100, 500, 1000 mg/kg Number of exposures: daily Test period: 41-51 d Test substance: yes Method: OECD Guideline 421 NOAEL Parent: 1.000 mg/kg NOAEL F1: 1.000 mg/kg

phaPlus® 1-Hexene	SAFETY DATA SHEET
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AlphaPlus® 1-Hexene Aspiration toxicity	: May be fatal if swallowed and enters airways. Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.
CMR effects	
1-Hexene	<ul> <li>Carcinogenicity: Not available 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.</li> </ul>
AlphaPlus® 1-Hexene Further information	: Solvents may degrease the skin.
CTION 12: Ecological inform	nation
Toxicity to fish	
1-Hexene	: LC50: 5,6 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) semi-static test Test substance: yes Method: OECD Test Guideline 203
Toxicity to daphnia and of	ther aquatic invertebrates
1-Hexene	<ul> <li>EC50: 4,4 mg/l</li> <li>Exposure time: 48 h</li> <li>Species: Daphnia magna (Water flea)</li> <li>static test Test substance: no</li> <li>Method: OECD Test Guideline 202</li> <li>Information given is based on data obtained from similar substances.</li> </ul>
Toxicity to algae	
1-Hexene	: NOEC: 1,8 mg/l Exposure time: 96 h Species: Pseudokirchneriella subcapitata (green algae) Growth inhibition Method: OECD Test Guideline 201 Information given is based on data obtained from similar substances.
	EC50: > 5,5 mg/l Exposure time: 96 h Species: Pseudokirchneriella subcapitata (green algae) Growth inhibition Method: OECD Test Guideline 201 Information given is based on data obtained from similar
	substances.

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Bioaccumulation	
1-Hexene	: This material is not expected to bioaccumulate.
Biodegradability	
1-Hexene	<ul> <li>67 - 98 %</li> <li>Testing period: 28 d</li> <li>Test substance: yes</li> <li>According to the results of tests of biodegradability this product is considered as being readily biodegradable.</li> </ul>
Ecotoxicology Assessmen	ıt
Acute aquatic toxicity 1-Hexene	: Toxic to aquatic life.
Chronic aquatic toxicity 1-Hexene	: No data available
Results of PBT assessment 1-Hexene	: Non-classified PBT substance, Non-classified vPvB substance
Additional ecological information	: Toxic to aquatic life., An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
SECTION 13: Disposal conside	rations
The information in this SDS	nertains only to the product as shipped
Use material for its intended may meet the criteria of a ha other State and local regulat regulated components may classified as a hazardous wa disposal facility.	purpose or recycle if possible. This material, if it must be discarded, azardous waste as defined by US EPA under RCRA (40 CFR 261) or ions. Measurement of certain physical properties and analysis for be necessary to make a correct determination. If this material is aste, federal law requires disposal at a licensed hazardous waste
Product	: The product should not be allowed to enter drains, water courses or the soil. 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 th	e Exposure Scenario in the Annex portion
SECTION 14: Transport information	ation
The shipping descriptions shipments in non-bulk pac	shown here are for bulk shipments only, and may not apply to kages (see regulatory definition).
Consult the appropriate dom	estic or international mode-specific and quantity-specific Dangerous
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Goods Regulations for additional shipping des etc.) Therefore, the information shown here, i description for the material. Flashpoints for th bill of lading.	scription requirements (e.g., technical name or names, may not always agree with the bill of lading shipping he material may vary slightly between the SDS and the
US DOT (UNITED STATES DEPARTMENT ( UN2370, 1-HEXENE, 3, II	OF TRANSPORTATION)
IMO / IMDG (INTERNATIONAL MARITIME D UN2370, 1-HEXENE, 3, II, (-26 °C)	DANGEROUS GOODS)
IATA (INTERNATIONAL AIR TRANSPORT A UN2370, 1-HEXENE, 3, II	ASSOCIATION)
ADR (AGREEMENT ON DANGEROUS GOC UN2370, 1-HEXENE, 3, II, (D/E)	DDS BY ROAD (EUROPE))
RID (REGULATIONS CONCERNING THE IN DANGEROUS GOODS (EUROPE)) UN2370, 1-HEXENE, 3, II	ITERNATIONAL TRANSPORT OF
ADN (EUROPEAN AGREEMENT CONCERN OF DANGEROUS GOODS BY INLAND WAT UN2370, 1-HEXENE, 3, II	NING THE INTERNATIONAL CARRIAGE FERWAYS)
I ransport in bulk according to Annex II of MAR	POL 73/78 and the IBC Code
SECTION 15: Regulatory information	
National legislation	
Ingredients : hex-1-ene	A Chemical Safety Assessment 209-753-1 has been carried out for this substance.
Major Accident Hazard: 96/82/ECLegislationHighly flam7b	Update: 2003 mable
Quantity 1: Quantity 2:	5.000 t 50.000 t
Water contaminating class : WGK 2 water (Germany)	ter endangering
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<b>Notification status</b> Europe REACH United States of America TSCA Canada DSL	<ul> <li>On the inventory, or in compliance with the inventory</li> <li>On the inventory, or in compliance with the inventory</li> <li>All components of this product are on the Canadian DSL</li> </ul>
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

#### **SECTION 16: Other information**

NFPA	Classification	
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: Health Hazard: 1 Fire Hazard: 3 Reactivity Hazard: 0



#### **Further information**

Legacy SDS Number : PE0016

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.

Ke	Key or legend to abbreviations and acronyms used in the safety data sheet					
ACGIH	ACGIH American Conference of Government Industrial Hygienists		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	PEL	Permissible Exposure Limit			
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			T
	Chemicals Association		
EINECS	European Inventory of Existing	PICCS	Philippines Inventory of
	Chemical Substances		Commercial Chemical Substances
MAK	Germany Maximum Concentration	PRNT	Presumed Not Toxic
	Values		
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	TLV	Threshold Limit Value
	on Cancer		
IECSC	Inventory of Existing Chemical	TWA	Time Weighted Average
	Substances in China		
ENCS	Japan, Inventory of Existing and	TSCA	Toxic Substance Control Act
	New Chemical Substances		
KECI	Korea, Existing Chemical	UVCB	Unknown or Variable Composition,
	Inventory		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.

H225	Highly flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H336	May cause drowsiness or dizziness.

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Annex	
1. Short title of Exposure Scenario: Ma	nufacture
Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in
Sector of use	<ul> <li>preparations at industrial sites</li> <li>SU3, SU8, SU9: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals</li> </ul>
Process category	<ul> <li>Manufacture of fine chemicals</li> <li>PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure</li> <li>PROC3: Use in closed batch process (synthesis or formulation)</li> <li>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</li> <li>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</li> <li>PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities</li> <li>PROC15: Use as laboratory reagent</li> </ul>
Environmental release category	: <b>ERC1, ERC4:</b> Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles
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
2.1 Contributing scenario control	ling environmental exposure for FRC1, FRC4
Manufacture of substances, Indu products, not becoming part of a	strial use of processing aids in processes and rticles
(Msafe)	: 166,834 tonnes/day
Environment factors not influenced	by risk management : 18.000 m3/d
Dilution Factor (River)	: 40
Dilution Factor (Coastal Areas)	: 100
Other given operational conditions a	ffecting environmental exposure
Number of emission days per year	: 300
Emission or Release Factor: Air	: 5%
Emission or Release Factor: Water	: 0,03 %
Emission or Release Factor: Soil	: 0,01 %
	organizational measures
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Δir	Treat air emission to provide a typical removal efficiency of				
Water	<ul> <li>(%): (Effectiveness: 90 %)</li> <li>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):</li> </ul>				
Remarks	<ul> <li>(Effectiveness: 96,8 %)</li> <li>Prevent discharge of undissolved substance to or recover from wastewater.</li> </ul>				
Remarks Remarks	<ul><li>Do not apply industrial sludge to natural soils.</li><li>Sludge should be incinerated, contained or reclaimed.</li></ul>				
Conditions and measures re Flow rate of sewage treatm	ated to municipal sewage treatment plant nt : 2.000 m3/d				
Effectiveness (of a measure	: 96,8 %				
Conditions and measures re Waste treatment	<ul> <li>ated to external treatment of waste for disposal</li> <li>External treatment and disposal of waste should comply with applicable local and/or national regulations.</li> </ul>				
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					
Remarks	: Liquid, vapour pressure > 10 kPa at STP				
Amount used Remarks	: Not applicable				
Frequency and duration of use       . Covers daily exposures up to 8 hours (unless stated differently)					
Other operational conditions affecting workers exposure         Remarks       : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.					
<b>Organizational measures to prevent /limit releases, dispersion and exposure</b> Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.					
3. Exposure estimation and reference to its source					
Environment					
Contributing Exposure Scenario Assessment Method	Specific conditions         Compartment         Value type         Level of Exposure         Risk characterization ratio				
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ERC1, ERC4	EUSES	Freshwater	0,0201 mg/L	0,181
		Marine water	0,0080 mg/L	0,0722
		Soil	3,54 mg/kg	0,999
		Freshwater	0,809 mg/kg	0,193
		Sediment	0.000 mm//	0.0770
		Marine sediment	0,323 mg/kg	0,0772
		All	0,232 mg/m3	
Guidance to	Downstream l	Jser to evaluate whether he wo	orks inside the bo	oundaries s
Guidance is thus, scaling Required rel either alone Required rel combination Further deta (http://cefic.o	based on assume may be necessa moval efficiency fo or in combination moval efficiency fo ils on scaling and org/en/reach-for-ir	ed operating conditions which may r ry to define appropriate site-specific or wastewater can be achieved using or air can be achieved using on-site control technologies are provided in ndustries-libraries.html).	not be applicable to a risk management m g onsite/offsite techr technologies, either n SpERC factsheet	all sites; neasures. nologies, alone or in
Short title of E	xposure Scenario	Distribution		
Main User Gro	oups	: <b>SU 3:</b> Industrial uses: Uses preparations at industrial sit	of substances as su es	uch or in
Sector of use		: SU3: Industrial Manufacturi	ng (all)	
Process categ	ory	: <b>PROC1:</b> Use in closed proc	ess, no likelihood of	exposure
5	,	PROC2: Use in closed, con	tinuous process with	occasional
		controlled exposure		recoucientai
		<b>PROC3</b> . Use in closed bate	h nrocase (synthasis	e or
		formulation)	n process (synthesis	5 01
		<b>PROC4</b> Use in botch and c	that process (a) oth	ooia) whore
		PROC4: Use in batch and c		esis) where
		opportunity for exposure ari	ses	
		PRUC8a: Transfer of subst	ance or preparation	
		(cnarging/discharging) from	to vessels/large cor	mainers at
		non-dedicated facilities		(
		discharging) from/ to vessel	ance or preparation s/ large containers a	(charging/ at dedicated
		Transfer of substance or n	reparation into smal	l containers
		(dedicated filling line includ	ing weighing)	
		PROC15. Lies as laboratory	reagent	
			iougon	
Environmental	release category	FRC1 FRC2 FRC3 FRC4	FRC5 FRC6a FR	C6b FRC6
a	. Sidudo datogoly	ERC6d FRC7: Manufacture	e of substances. For	mulation of
		preparations Formulation in	materials Industria	al use of
		proparations, ronnulation in	s and products not	hecoming pr
		of articlas Industrial use rec	sulting in inclusion in	ito or onto o
		matrix Industrial use result	na in monufacture of	f another
		manix, muusinar use result	atoc) Industrial use	of reactive
			ales), muusifial use	or reactive
		processing aids, industrial u	ise of monomers for	manufacture
		or thermoplastics, Industrial	use of process regu	lators for
		polymerisation processes in	production of resins	s, rubbers,
		polymers, Industrial use of s	substances in closed	a systems
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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.
2.1 Contributing scenario contro	lling environmental exposure for:ERC1_ERC2_ERC3
ERC4, ERC5, ERC6a, ERC6b, ER Formulation of preparations, For in processes and products, not b inclusion into or onto a matrix, Ir substance (use of intermediates) use of monomers for manufactur regulators for polymerisation pro Industrial use of substances in c	C6c, ERC6d, ERC7: Manufacture of substances, mulation in materials, Industrial use of processing aids becoming part of articles, Industrial use resulting in ndustrial use resulting in manufacture of another h, Industrial use of reactive processing aids, Industrial re of thermoplastics, Industrial use of process becesses in production of resins, rubbers, polymers, losed systems
(Msafe)	: 5.011,707 tonnes/day
Environment factors not influenced	hy risk management
Flow rate	· 18 000 m3/d
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100
Other given operational conditions a	affecting environmental exposure
Number of emission days per year	: 365
Emission or Release Factor: Air	: 0,1 %
Emission or Release Factor: Water	: 0,001 %
Emission or Release Factor: Soil	: 0,001 %
Technical conditions and measures	<ul> <li>/ Organizational measures</li> <li>Treat air emission to provide a typical removal efficiency of</li> </ul>
	(%): (Effectiveness: 90 %)
Water	<ul> <li>I reat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)</li> </ul>
Remarks	: Prevent discharge of undissolved substance to or recover from wastewater.
Remarks	Do not apply industrial sludge to natural soils.
remarks	sluage should be incinerated, contained or reclaimed.
Conditions and measures related to Flow rate of sewage treatment	municipal sewage treatment plant : 2.000 m3/d
Effectiveness (of a measure)	: 96,8 %
Conditions and measures related to	external treatment of waste for disposal
Waste treatment	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario contro PROC4, PROC8a, PROC8b,, PRO Use in closed, continuous proce batch process (synthesis or form where opportunity for exposure a	lling worker exposure for: PROC1, PROC2, PROC3, C15: Use in closed process, no likelihood of exposure, ss with occasional controlled exposure, Use in closed nulation), Use in batch and other process (synthesis) arises, Transfer of substance or preparation
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(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						
Product chara Remarks	cteristics	: Liqui	d, vapour pressu	ure > 10 kPa	a at STP	
Amount used Remarks		: Not a	applicable			
Frequency and Remarks	Frequency and duration of use       : Covers daily exposures up to 8 hours (unless stated differently)					
Other operatio Remarks	nal conditions a	ffecting worke : Assu imple ambi	ers exposure mes a good bas emented., Assum ent temperature	ic standard nes use at r , unless sta	of occupation not more than ted differently	al hygiene is 20°C above
Organizational Do not ingest. product. Ident with substanc contamination report any ski	Organizational measures to prevent /limit releases, dispersion and exposure Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.					
3. Exposure e	estimation and	reference to	its source			
Environment						
Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	EUSES		Freshwater		0,0014 mg/L	0,0123
			Marine water		0,135 µg/L	0,00122
			Soil		0,0581 mg/kg	0,0164
			Freshwater		0,055 mg/kg	0,0131
			Marine sediment		0.0055 mg/kg	0.0013
			Air		0,0023 mg/m3	5,0010
ERC1: Manufacture of substances ERC2: Formulation of preparations ERC3: Formulation in materials ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC6b: Industrial use of reactive processing aids ERC6c: Industrial use of monomers for manufacture of thermoplastics ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers ERC7: Industrial use of substances in closed systems						
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#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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 (http://cefic.org/en/reach-for-industries-libraries.html).

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

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in
Sector of use	: <b>SU3. SU8. SU9:</b> Industrial Manufacturing (all). Manufacture of
	bulk, large scale chemicals (including petroleum products),
	Manufacture of fine chemicals
Process category	<b>PROC1:</b> Use in closed process, no likelihood of exposure
	PROC2: Use in closed, continuous process with occasional
	controlled exposure
	formulation)
	<b>PROC4</b> : 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
	<b>PROCED:</b> I ransfer of substance or preparation (charging/
	PROC15: Use as laboratory reagent
Environmental release category	: ERC6a: Industrial use resulting in manufacture of another
	substance (use of intermediates)
Further information	
	Use as an isolated intermediate under strictly controlled
	conditions
2.1 Contributing scenario contre	Illing environmental exposure for FRC6a: Industrial use
resulting in manufacture of another	her substance (use of intermediates)
(Msafe)	: 166,837 tonnes/day
Environment factors not influenced	by risk management
Flow rate	: 18.000 m3/d
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100
Other given operational conditions	affecting environmental exposure
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Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water	: 300 : 2,5 % : 0.03 %
Emission or Release Factor: Soil	: 0,1 %
Technical conditions and measures	/ Organizational measures
All	(%): (Effectiveness: 80 %)
Water	<ul> <li>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):</li> <li>(Effectiveness: 96.8 %)</li> </ul>
Remarks	<ul> <li>Prevent discharge of undissolved substance to or recover from wastewater.</li> </ul>
Remarks	Do not apply industrial sludge to natural soils.
Remarks	: Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to Flow rate of sewage treatment	municipal sewage treatment plant : 2.000 m3/d
plant effluent Effectiveness (of a measure)	: 96,8 %
Conditions and measures related to	external treatment of waste for disposal
Waste treatment	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
batch process (synthesis or form where opportunity for exposure (charging/discharging) from/to v Transfer of substance or prepara containers at dedicated facilities	nulation), Use in batch and other process (synthesis) arises, Transfer of substance or preparation essels/large containers at non-dedicated facilities, ation (charging/ discharging) from/ to vessels/ large , Use as laboratory reagent
Product characteristics	
Remarks	: Liquid, vapour pressure > 10 kPa at STP
Amount used	
Remarks	
Frequency and duration of use	
Remarks	· Covers deily evenesures up to 0 hours (uplace stated
	: Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecti	: Covers daily exposures up to 8 hours (unless stated differently) ng workers exposure
Other operational conditions affecti Remarks	<ul> <li>Covers daily exposures up to 8 hours (unless stated differently)</li> <li>ng workers exposure</li> <li>Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.</li> </ul>
Other operational conditions affecting Remarks Organizational measures to prevent Do not ingest. If swallowed then seed product. Identify potential areas for in with substance likely. Clean up conta contamination immediately. Provide la report any skin problems that may de	<ul> <li>Covers daily exposures up to 8 hours (unless stated differently)</li> <li>ng workers exposure         <ul> <li>Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.</li> </ul> </li> <li>/limit releases, dispersion and exposure         <ul> <li>cimmediate medical assistance., Avoid direct skin contact with adirect skin contact. Wear gloves (tested to EN374) if hand contact unination/spills as soon as they occur. Wash off any skin basic employee training to prevent / minimise exposures and to evelop., No other specific measures identified.</li> </ul> </li> </ul>
<ul> <li>Other operational conditions affecting Remarks</li> <li>Organizational measures to prevented Do not ingest. If swallowed then seel product. Identify potential areas for inwith substance likely. Clean up contact contamination immediately. Provide I report any skin problems that may design of the statement of the</li></ul>	<ul> <li>Covers daily exposures up to 8 hours (unless stated differently)</li> <li>ng workers exposure <ul> <li>Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.</li> </ul> </li> <li>/limit releases, dispersion and exposure <ul> <li>immediate medical assistance., Avoid direct skin contact with ndirect skin contact. Wear gloves (tested to EN374) if hand contact unination/spills as soon as they occur. Wash off any skin basic employee training to prevent / minimise exposures and to evelop., No other specific measures identified.</li> </ul></li></ul>

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#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC6a	EUSES		Freshwater		0,0081 mg/L	0,0726
			Marine water		0,805 µg/L	0,00725
			Soil		0,354 mg/kg	0,0999
			Freshwater		0,325 mg/kg	0,0776
			sediment			
			Marine sediment		0,0324 mg/kg	0,00775
			Air		0,0232 mg/m3	
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)						

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

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 (http://cefic.org/en/reach-for-industries-libraries.html).

#### 1. Short title of Exposure Scenario: Formulation

Sector of use       :       SU3, SU 10: Industrial Manufacturing (all), 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)         PRCC4: 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 tabletting, compression, extrusion, pelletization; Industrial setting; PROC15: Use as laboratory reagent         Environmental release category       :         Further information       :         SDS Number:100000068730       22/48		Main User Groups	:	<b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Process category       :       PRÓC1: 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       PROC8: 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 (charging/discharging) from/to vessels/large containers at dedicated facilities         PROC8b: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)       PROC14: Production of mixtures or articles by tabletting, compression, extrusion, pelletization; Industrial setting; PROC15: Use as laboratory reagent         Environmental release category       :       ERC2: Formulation of preparations         Further information       :       :		Sector of use	:	<b>SU3, SU 10:</b> Industrial Manufacturing (all), Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Environmental release category       :       ERC2: Formulation of preparations         Further information       :         SDS Number:10000068730       22/48		Process category	:	<ul> <li>PROC1: Use in closed process, no likelihood of exposure</li> <li>PROC2: Use in closed, continuous process with occasional controlled exposure</li> <li>PROC3: Use in closed batch process (synthesis or formulation)</li> <li>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</li> <li>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</li> <li>PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities</li> <li>: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li> <li>PROC14: Production of mixtures or articles by tabletting, compression, extrusion, pelletization; Industrial setting;</li> <li>PROC15: Use as laboratory reagent</li> </ul>
Further information:SDS Number:1000006873022/48		Environmental release category	:	ERC2: Formulation of preparations
SDS Number:10000068730 22/48		Further information	:	
	S	DS Number:100000068730		22/48

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	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
2.1 Contributing scenario contro preparations	Iling environmental exposure for:ERC2: Formulation of
(Msafe)	: 248,014 tonnes/day
Environment factors not influenced	by risk management
Flow rate	: 18.000 m3/d
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	. 100
Other given operational conditions a	affecting environmental exposure
Number of emission days per year	: 300
Emission or Release Factor: Air	: 2,5 %
Emission or Release Factor: Water	: 0,02 %
Emission or Release Factor: Soil	: 0,01 %
Technical conditions and measures	/ Organizational measures
Air	: Treat air emission to provide a typical removal efficiency of
Matar	(%): (Effectiveness: 0 %)
water	provide the required removal efficiency of $\geq$ (%):
	(Effectiveness: 96,8 %)
Remarks	: Prevent discharge of undissolved substance to or recover
Demerke	from wastewater.
Remarks	<ul> <li>Do not apply industrial sludge to natural solls.</li> <li>Sludge should be incinerated, contained or reclaimed</li> </ul>
Remarks	. Shuge should be incinerated, contained of reclaimed.
Conditions and measures related to Flow rate of sewage treatment	municipal sewage treatment plant : 2.000 m3/d
Effectiveness (of a measure)	: 96,8 %
	and an all the state of the state for the state of the
Waste treatment	<ul> <li>External treatment of waste for disposal</li> <li>External treatment and disposal of waste should comply with applicable local and/or national regulations.</li> </ul>
2.2 Contributing scenario contro PROC4, PROC8a, PROC8b,, PRO exposure, Use in closed, continu- in closed batch process (synthes (synthesis) where opportunity fo (charging/discharging) from/to ver- Transfer of substance or prepara containers at dedicated facilities containers (dedicated filling line, by tabletting, compression, extru- reagent	Iling worker exposure for: PROC1, PROC2, PROC3, 9C14, PROC15: Use in closed process, no likelihood of 10us process with occasional controlled exposure, Use sis or formulation), Use in batch and other process or exposure arises, Transfer of substance or preparation essels/large containers at non-dedicated facilities, ation (charging/ discharging) from/ to vessels/ large or, Transfer of substance or preparation into small , including weighing), Production of mixtures or articles usion, pelletization; Industrial setting;, Use as laboratory
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Product characteristics Remarks	:	Liquid, vapour pressure > 10 kPa at STP
Amount used Remarks	:	Not applicable
Frequency and duration of use		
Remarks	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecti	ng	workers exposure
Remarks	:	Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

#### Organizational measures to prevent /limit releases, dispersion and exposure

Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.

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

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC2	EUSES		Freshwater		0,0268 mg/L	0,241
			Marine water		0,0027 mg/L	0,0241
			Soil		1,19 mg/kg	0,336
			Freshwater		1,08 mg/kg	0,258
			sediment			
			Marine sediment		0,108 mg/kg	0,0258
			Air		0.579 ma/m3	

ERC2: Formulation of preparations

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

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 (http://cefic.org/en/reach-for-industries-libraries.html).

#### 1. Short title of Exposure Scenario: Lubricants - Industrial

Main User Groups

: SU 3: Industrial uses: Uses of substances as such or in

24/48

SDS Number:100000068730

AlnhaPlus® 1-Hexene	SAFETY DATA SHEET
Version 3.5	Revision Date 2016-05-22
	preparations at industrial sites
Sector of use Process category	<ul> <li>SU3: Industrial Manufacturing (all)</li> <li>PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure</li> </ul>
	<ul> <li>controlled exposure</li> <li>PROC3: Use in closed batch process (synthesis or formulation)</li> <li>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</li> <li>PROC7: Industrial spraying</li> <li>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</li> <li>PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities</li> <li>: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li> <li>PROC10: Roller application or brushing</li> <li>PROC17: Lubrication at high energy conditions and in partly</li> </ul>
	open process PROC18: Greasing at high energy conditions
Environmental release category	<ul> <li>ERC4, ERC7: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of substances in closed systems</li> </ul>
Further information	: Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes.
2.1 Contributing scenario control use of processing aids in proces Industrial use of substances in c (Msafe)	Iling environmental exposure for:ERC4, ERC7: Industrial ses and products, not becoming part of articles, losed systems : 805,271 tonnes/day
Environment footors not influenced	hu viele men even even
Flow rate	in the second
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100
Other given operational conditions a	affecting environmental exposure
Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil	: 300 : 0,1 % : 0,003 % : 0,1 %
Technical conditions and measures Air	<ul> <li>/ Organizational measures</li> <li>Treat air emission to provide a typical removal efficiency of</li> <li>(%): (Effectiveness: 70.%)</li> </ul>
Water	: Treat onsite wastewater (prior to receiving water discharge) to
SDS Number:100000068730	25/48

AlphaPlus® 1-Hexene         Version 3.5       Revision Date 2016-05-22.         provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)         Remarks       : Prevent discharge of undissolved substance to or recover from wastewater.         Remarks       : Do not apply industrial sludge to natural soils.         Remarks       : Sludge should be incinerated, contained or reclaimed.         Conditions and measures related to municipal sewage treatment plant Flow rate of sewage treatment plant effluent       : 2.000 m3/d         Effectiveness (of a measure)       : 96,8 %         Conditions and measures related to external treatment of waste for disposal         Waste treatment       : 2.000 m3/d         plant effluent       : External treatment and disposal of waste should comply with applicable local and/or national regulations.         2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC4b, PROC10, PROC13, PROC17, PROC18: Use in closed process, no likelihood of exposure, Use in closed portunity for exposure arises, industrial spraying, 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 ine, including weighing), Roller applicable         Product characteristics Remarks       : Liquid, vapour pressure > 10 kPa at STP         Amount used					SAFE	TY DATA SHEET
Version 3.5         Revision Date 2016-05-22           provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)           Remarks         :           Remarks         :           Remarks         :           Remarks         :           Remarks         :           Remarks         :           Conditions and measures related to municipal sewage treatment plant           Flow rate of sewage treatment         :           2.000 m3/d           plant effluent           Effectiveness (of a measure)         :           96,8 %           Conditions and measures related to external treatment of waste for disposal           Waste treatment         :           2.20 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC6b, PROC10, PROC17, PROC17, PROC18: 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, Industrial synaying, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Transfer of substance or preparation (charging/discharging) inom/to vessels/large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Roller application or brushing, Treatment of articles by dipping and pouring, Lubri	AlphaPlus® 1-Hexene					
provide the required removal efficiency of ≥ (%):         (Effectiveness: 96.8 %)         Remarks       :         Prevent discharge of undissolved substance to or recover from wastewater.         Remarks       ::         Remarks       ::         Conditions and measures related to municipal sewage treatment plant         Flow rate of sewage treatment       ::         Conditions and measures related to external treatment of waste for disposal         Waste treatment       :         2.000 m3/d         plant effluent         Effectiveness (of a measure)       :         96.8 %         Conditions and measures related to external treatment of waste for disposal         Waste treatment       :         2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC64, PROC6, PROC64, PROC68, PROC64, PROC54, PROC7, PROC13, PROC17, PROC17, PROC18: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, use in closed portunity for exposure arises, Industrial spraying, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation into small containers (dedicated faciliting line, including weighing), Roller application or brushing, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process, Greasing at high energy conditions and in partly open process, Greasing at high energy conditions and in	Version 3.5				Revision	Date 2016-05-22
Remarks       : Do not apply industrial sludge to natural solts.         Remarks       : Sludge should be incinerated, contained or reclaimed.         Conditions and measures related to municipal sewage treatment plant effluent       : 2.000 m3/d         Effectiveness (of a measure)       : 96,8 %         Conditions and measures related to external treatment and disposal of waste should comply with applicable local and/or national regulations.         2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC3, PROC48, PROC10, PROC19, PROC18: 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, Industrial spraying, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation into small containers (dedicated falliting line, including weighling), Roller application or busing, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process, Greasing at high energy conditions         Product characteristics       : Liquid, vapour pressure > 10 kPa at STP         Amount used       : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.         Other operational conditions affecting workers exposure       Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential are	Remarks	provie (Effee : Preve from	de the required r ctiveness: 96,8 % ent discharge of wastewater.	emoval effi %) undissolved	ciency of ≥ (% d substance t	6): o or recover
Conditions and measures related to municipal sewage treatment plant         Flow rate of sewage treatment       : 2.000 m3/d         plant effluent       :         Effectiveness (of a measure)       : 96,8 %         Conditions and measures related to external treatment of waste for disposal         Waste treatment       : External treatment and disposal of waste should comply with applicable local and/or national regulations.         2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC3b, PROC10, PROC13, PROC17, PROC18: 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, Industrial spraying, Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation into small containers (dedicated faciliting line, including weighing), Roller application or brushing, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process, Greasing at high energy conditions         Product characteristics       Remarks       : Covers dally exposures up to 8 hours (unless stated differently)         Other operational conditions affecting workers exposure       : Assumes a good basic standard of occupational hygiene is implemented, Assumes use at not more than 20°C above ambient temperature, unless stated differently.         Organizational measures to prevent /limit releases, dispersion and exposure	Remarks Remarks	: Do no : Sludg	ot apply industria ge should be inci	al sludge to nerated, co	natural soils. Intained or re	claimed.
prime tendent       Effectiveness (of a measure)       : 96,8 %         Conditions and measures related to external treatment of waste for disposal       Waste treatment       : External treatment and disposal of waste should comply with applicable local and/or national regulations.         2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC17, PROC18: 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, Industrial spraying, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at 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), Roller application or brushing, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process, Greasing at high energy conditions         Product characteristics       Remarks       : Liquid, vapour pressure > 10 kPa at STP         Amount used       : Not applicable         Frequency and duration of use       : Assumes a good basic standard of occupational hygiene is implemented, Assume use at not rower than 20°C above ambient temperature, unless stated differently.         Organizational measures to prevent /limit releases, dispersion and exposure       Do not ingest. If swallowed then seek immediate medical assistance. Avoid direct skin contact with product. Ident	Conditions and measures related to n Flow rate of sewage treatment	n <b>unicip</b> : 2.000	<b>al sewage treat</b> ) m3/d	ment plant	t	
Conditions and measures related to external treatment of waste for disposal         Waste treatment       : External treatment and disposal of waste should comply with applicable local and/or national regulations.         2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC6b, PROC10, PROC13, PROC17, PROC18: 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 arging/ from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation into small containers (decicated filling line, including weighing), Roller application or brushing, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process, Greasing at high energy conditions         Product characteristics       Remarks       : Liquid, vapour pressure > 10 kPa at STP         Amount used       : Covers daily exposures up to 8 hours (unless stated differently)         Other operational conditions affecting workers exposure       : Assumes use at not more than 20°C above ambient temperature, unless stated differently.         Organizational measures to prevent //imit releases, dispersion and exposure       Do not ingest. If swallowed then seek immediate medical assistance., 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	Effectiveness (of a measure)	: 96,8	%			
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8b, PROC8b, PROC10, PROC17, PROC18: Use in closed process, no likelihood of exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Industrial spraying, 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), Roller application or brushing, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process, Greasing at high energy conditions  Product characteristics Remarks : Liquid, vapour pressure > 10 kPa at STP  Amount used Remarks : Not applicable  Frequency and duration of use Remarks : Covers daily exposures up to 8 hours (unless stated differently)  Other operational conditions affecting workers exposure Remarks : Assumes a good basic standard of occupational hygiene is implemented, Assumes use at not more than 20°C above ambient temperature, unless stated differently.  Organizational measures to prevent /limit releases, dispersion and exposure Do not ingest. If swallowed then seek immediate medical assistance. 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 / minings exposures and to report any skin problems that may develop., No other specific measures identified.	Conditions and measures related to e Waste treatment	e <b>xternal</b> : Exter applie	treatment of w nal treatment an cable local and/c	<b>aste for di</b> Id disposal or national r	<b>sposal</b> of waste shou egulations.	uld comply with
Product characteristics         Remarks       : Liquid, vapour pressure > 10 kPa at STP         Amount used         Remarks       : Not applicable         Frequency and duration of use         Remarks       : Covers daily exposures up to 8 hours (unless stated differently)         Other operational conditions affecting workers exposure         Remarks       : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.         Organizational measures to prevent /limit releases, dispersion and exposure         Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.         3. Exposure estimation and reference to its source	PROC4, PROC7, PROC8a, PROC8b,, PROC10, PROC13, PROC17, PROC18: 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, Industrial spraying, 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), Roller application or brushing, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process, Greasing at high energy conditions					
Amount used Remarks       : Not applicable         Frequency and duration of use Remarks       : Covers daily exposures up to 8 hours (unless stated differently)         Other operational conditions affecting workers exposure Remarks       : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.         Organizational measures to prevent /limit releases, dispersion and exposure Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.         3. Exposure estimation and reference to its source	Product characteristics Remarks	: Liqui	d, vapour pressu	ire > 10 kPa	a at STP	
Frequency and duration of use Remarks       : Covers daily exposures up to 8 hours (unless stated differently)         Other operational conditions affecting workers exposure Remarks       : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.         Organizational measures to prevent /limit releases, dispersion and exposure Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.         3. Exposure estimation and reference to its source	Amount used Remarks	: Not a	pplicable			
Other operational conditions affecting workers exposure         Remarks       : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.         Organizational measures to prevent /limit releases, dispersion and exposure         Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.         3. Exposure estimation and reference to its source	Frequency and duration of use Remarks	: Cove differ	rs daily exposur ently)	es up to 8 h	ours (unless	stated
<ul> <li>Organizational measures to prevent /limit releases, dispersion and exposure         Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.</li> <li>3. Exposure estimation and reference to its source</li> </ul>	Other operational conditions affecting Remarks	<b>g worke</b> : Assu imple ambi	ers exposure mes a good bas emented., Assum ent temperature,	ic standard les use at n unless sta	of occupatior ot more than ted differently	nal hygiene is 20°C above ⁄.
3. Exposure estimation and reference to its source	Organizational measures to prevent /limit releases, dispersion and exposure Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.					
	3. Exposure estimation and reference to its source					
Environment	Environment					
Contributing         Exposure Assessment         Specific         Compartment         Value type         Level of         Risk characterization	Contributing Exposure Spe Assessment	cific	Compartment	Value type	Level of	Risk characterization
SDS Number:10000068730 26/48	SDS Number:100000068730			26/48		

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#### SAFETY DATA SHEET

# AlphaPlus® 1-Hexene

Version 3.5

Scenario	Method	conditions		Exposure	ratio
ERC4, ERC7	EUSES		Freshwater	0,071 µa/L	0,0006
. ,			Marine water	0.0063 ug/l	0.00006
			Soil	0.001 mg/kg	0.00032
			Freshwater	0.0029 ma/ka	0 0007
			sediment	0,0020 mg/kg	5,0007
			Marine sediment	0.254 µa/ka	0.00006
			Air	0,447 µg/m3	,
Guidance to	Downstream	User to eva	luate whether he	vorks inside the bo	oundaries
the Exposi	ure Scenario				
Guidance is thus, scalin Required re either alone Required re combination Further det	based on assu g may be neces moval efficiency or in combination moval efficiency n. ails on scaling a	med operating sary to define a of for wastewate on. of for air can be nd control tech	conditions which may appropriate site-speci er can be achieved us achieved using on-si nologies are provideo	y not be applicable to a fic risk management n ing onsite/offsite techr te technologies, either I in SpERC factsheet	all sites; neasures. nologies, alone or in
	org/en/reach-foi		aries.ntmi).		
Short title of E	xposure Scenar		.s - riviessional		
Main User Gr	oups	: SU 2 educ	22: Professional uses cation, entertainment,	: Public domain (admin services, craftsmen)	nistration,
Sector of use		: SU 2 educ	22: Professional uses cation, entertainment,	: Public domain (admin services, craftsmen)	nistration,
Process categ	jory	: PRC PRC cont PRC form PRC oppo PRC (cha non- PRC disc facil : Tra (dec PRC PRC PRC PRC PRC	<b>C1:</b> Use in closed pr <b>C2:</b> Use in closed, co rolled exposure <b>C3:</b> Use in closed ba pulation) <b>C4:</b> Use in batch and prunity for exposure a <b>C8a:</b> Transfer of sub- rging/discharging) fro- dedicated facilities <b>C8b:</b> Transfer of sub- tharging) from/ to vess ities ansfer of sub-stance of licated filling line, inclu- <b>C10:</b> Roller application <b>C11:</b> Non industrial so <b>C13:</b> Treatment of an <b>C17:</b> Lubrication at h	ocess, no likelihood of ontinuous process with atch process (synthesis d other process (synthe arises stance or preparation m/to vessels/large cor estance or preparation sels/ large containers a r preparation into smal uding weighing) on or brushing spraying ticles by dipping and p	exposure n occasional s or esis) where ntainers at (charging/ at dedicated I containers
		oper PRC PRC profe	n process DC18: Greasing at hig DC20: Heat and press essional use but close	h energy conditions ure transfer fluids in d ed systems	and in partl <u>y</u> ispersive,
Environmenta	l release catego	oper PRC PRC profe ry : ERC of pr	n process DC18: Greasing at hig DC20: Heat and press essional use but close C8a, ERC8d, ERC9a, rocessing aids in oper	h energy conditions oure transfer fluids in d ed systems <b>ERC9b:</b> Wide dispers n systems, Wide dispe	and in partly ispersive, ive indoor us rsive outdoo

Alpha Diuce 1 Havana	SAFETY DATA SHEET				
AlphaPlus® I-nexene					
Version 3.5	Revision Date 2016-05-22				
	use of processing aids in open systems, Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems				
Further information	:				
	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.				
2.1 Contributing scenario controll ERC9a, ERC9b: Wide dispersive in dispersive outdoor use of process of substances in closed systems, systems	ing environmental exposure for:ERC8a, ERC8d, ndoor use of processing aids in open systems, Wide sing aids in open systems, Wide dispersive indoor use Wide dispersive outdoor use of substances in closed				
(Msafe)	: 0,873 tonnes/day				
Environment factors not influenced b	vrisk management				
Flow rate	: 18.000 m3/d				
Dilution Factor (River)	: 10				
Dilution Factor (Coastal Areas)	: 100				
Other given operational conditions af	fecting environmental exposure				
Number of emission days per year	: 300				
Emission or Release Factor: Air	: 60 % : 5 %				
Emission or Release Factor: Soil	5 %				
Air	Organizational measures Treat air emission to provide a typical removal efficiency of				
	(%): (Effectiveness: 0 %)				
Water	: Treat onsite wastewater (prior to receiving water discharge) to				
	provide the required removal efficiency of $\geq$ (%):				
Remarks	<ul> <li>Effectiveness: 96,8 %)</li> <li>Prevent discharge of undissolved substance to or recover</li> </ul>				
	from wastewater.				
Remarks	: Do not apply industrial sludge to natural soils.				
Remarks	: Sludge should be incinerated, contained or reclaimed.				
Conditions and measures related to r	nunicipal sewage treatment plant				
Flow rate of sewage treatment plant effluent	: 2.000 m3/d				
Effectiveness (of a measure)	: 96,8 %				
Conditions and measures related to external treatment of waste for disposal					
Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.					
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3,					
PROC4, PROC8a, PROC8b,, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20:					
Use in closed process, no likelihood of exposure, Use in closed, continuous process					
with occasional controlled exposit	ure, Use in closed batch process (synthesis or				
ionnulation, use in patch and otr	ier process (synthesis) where opportunity for exposure				
SDS Number:100000068730	28/48				

SAFETY DATA SHEET AlphaPlus® 1-Hexene Version 3.5 Revision Date 2016-05-22 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), Roller application or brushing, Non industrial spraying, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process, Greasing at high energy conditions, Heat and pressure transfer fluids in dispersive, professional use but closed systems **Product characteristics** Remarks : Liquid, vapour pressure > 10 kPa at STP Amount used Remarks : Not applicable Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated Remarks differently) Other operational conditions affecting workers exposure Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently. Organizational measures to prevent /limit releases, dispersion and exposure Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified. 3. Exposure estimation and reference to its source Environment Risk Contributing Exposure Specific Compartment Value type Level of characterization Scenario Assessment conditions Exposure Method ratio ERC8a, ERC8d, EUSES Freshwater 0,131 µg/L 0,00118 ERC9a, ERC9b Marine water 0,0123 µg/L 0,00011 0,0038 mg/kg 0,00107 Soil Freshwater 0,0053 mg/kg 0,00126 sediment Marine sediment 0,000119 0,496 µg/kg Air 0,179 µg/m3 ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario SDS Number:10000068730 29/48

	SAFETY DATA SHEET
AlphaPlus® 1-Hexene	
Version 3.5	Revision Date 2016-05-22
Guidance is based on assumed op thus, scaling may be necessary to	erating conditions which may not be applicable to all sites; define appropriate site-specific risk management measures.
Required removal efficiency for wa either alone or in combination.	stewater can be achieved using onsite/offsite technologies,
Required removal efficiency for air combination.	can be achieved using on-site technologies, either alone or in
Further details on scaling and cont (http://cefic.org/en/reach-for-indust	rol technologies are provided in SpERC factsheet ries-libraries.html).
1. Short title of Exposure Scenario: Luk	oricants - Consumer
Main User Groups	: <b>SU 21:</b> Consumer uses: Private households (= general public
Sector of use	<ul> <li>SU 21: Consumer uses: Private households (= general public = consumers)</li> </ul>
Product category	<ul> <li>PC1: Adhesives, sealants</li> <li>PC24: Lubricants, greases, release products</li> <li>PC31: Polishes and wax blends</li> </ul>
Environmental release category	: <b>ERC8a, ERC8d, ERC9a, ERC9b:</b> Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems
Further information	: Covers the consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment maintenance and disposal of waste oil.
2.1 Contributing scenario control ERC9a, ERC9b: Wide dispersive i dispersive outdoor use of proces of substances in closed systems, systems Product characteristics (Msafe)	ling environmental exposure for:ERC8a, ERC8d, ndoor use of processing aids in open systems, Wide sing aids in open systems, Wide dispersive indoor use Wide dispersive outdoor use of substances in closed : 0,804 tonnes/day
Environment factors not influenced k	ny risk management
Flow rate	: 18.000 m3/d
Dilution Factor (River) Dilution Factor (Coastal Areas)	: 10 : 100
Other given operational conditions a	ffecting environmental exposure
Number of emission days per year	: 365
Emission or Release Factor: Air	: 60 %
Emission or Release Factor: Water Emission or Release Factor: Soil	: 5% : 5%
Technical conditions and measures /	Organizational measures
	: I reat air emission to provide a typical removal efficiency of
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AlphaPlus® 1-Hexene					
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Water	(%): ( : Treat provid (Effed	Effectiveness: 0 onsite wastewa de the required r	) %) ter (prior to removal efficient	receiving wa ciency of ≥ (%	ter discharge) to 6):
Remarks	: Preve	ent discharge of wastewater.	undissolved	d substance t	o or recover
Remarks Remarks	: Do no : Sludg	ot apply industria ge should be inci	al sludge to inerated, co	natural soils. ntained or re	claimed.
Conditions and measures related Flow rate of sewage treatment	to municip : 2.000	<b>al sewage treat</b> ) m3/d	ment plant	:	
Effectiveness (of a measure) Procedures to limit air emissions from Sewage Treatment Plant	: 96,8 <sup>·</sup> :	%			
Conditions and measures related Waste treatment	to external : Exter applio	treatment of w nal treatment an cable local and/c	a <b>ste for dis</b> d disposal o pr national re	sposal of waste shou egulations.	uld comply with
2.2 Contributing scenario cont Adhesives, sealants, Lubrican	trolling con ts, greases	nsumer expos s, release proc	sure for: P ducts, Pol	C1, PC24, F ishes and v	PC31: vax blends
Product characteristics Remarks	: Liquio	d, vapour pressu	ıre > 10 kPa	a at STP	
Amount used Remarks	: Not a	pplicable			
Other given operational conditior Remarks	ns affecting : Assu imple ambie	<b>consumers ex</b> mes a good bas mented., Assum ent temperature,	<b>posure</b> ic standard nes use at n , unless stat	of occupatior ot more than ted differently	nal hygiene is 20°C above
Conditions and measures related protection and hygiene) Consumer Measures	to protection : Do not assis poter to EN conta conta to pre proble identi	on of consumer ot ingest. If swall tance., Avoid dir tal areas for inc l374) if hand cor umination/spills a umination immed event / minimise ems that may de fied.	r (e.g. beha lowed then a rect skin cor direct skin con tact with su as soon as t liately. Prov exposures evelop., No	evioral advic seek immedia ntact with pro ontact. Wear ubstance likel hey occur. W ide basic em and to report other specific	e, personal ate medical duct. Identify gloves (tested y. Clean up ash off any skin ployee training any skin measures
3. Exposure estimation and re	ference to	its source			
Environment					
Contributing Exposure Scenario Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC8a, ERC8d, EUSES ERC9a, ERC9b		Freshwater	24/40	0,116 µg/L	0,00104
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	Marine water	0,0108 µg/L	0,000097
	Freshwater	0,0031 mg/kg 0,0047 mg/kg	0,000882
	sediment	0.435 µg/kg	0.000104
	Air	0,435 μg/kg 0,147 μg/m3	0,000104
ERC9b: Wide dispersive indoor use ERC9a: Wide dispersive indoor use ERC9b: Wide dispersive outdoor use	of processing aids in open system of substances in closed system of substances in closed system	stems is ms	
. Guidance to Downstream User y the Exposure Scenario	to evaluate whether he w	orks inside the bo	oundaries se
Guidance is based on assumed op thus, scaling may be necessary to	perating conditions which may define appropriate site-specific	not be applicable to a c risk management n	all sites; neasures.
Required removal efficiency for wa either alone or in combination. Required removal efficiency for air combination.	stewater can be achieved usir can be achieved using on-site	ng onsite/offsite techr technologies, either	nologies, alone or in
Further details on scaling and cont (http://cefic.org/en/reach-for-indust	trol technologies are provided i tries-libraries.html).	n SpERC factsheet	
Short title of Exposure Scenario: Me	tal working fluids / rolling	oils - Industrial	
Main User Groups Sector of use Process category	<ul> <li>SU 3: Industrial uses: Uses preparations at industrial si</li> <li>SU3: Industrial Manufactur</li> <li>PROC1: Use in closed pro PROC2: Use in closed pro PROC3: Use in closed, con controlled exposure PROC3: Use in closed bate formulation)</li> <li>PROC4: Use in batch and opportunity for exposure and : PROC 5: Mixing or blendi formulation of preparations significant contact)</li> <li>PROC7: Industrial spraying PROC8a: Transfer of subs (charging/discharging) from non-dedicated facilities</li> <li>PROC8b: Transfer of subs discharging) from/ to vesse facilities</li> <li>Transfer of substance or p (dedicated filling line, inclus PROC13: Treatment of arti PROC17: Lubrication at hig open process</li> </ul>	of substances as su tes ing (all) cess, no likelihood of ntinuous process with ch process (synthesis other process (synthesis other process (synthesis other process (synthesis other process (synthesis and articles (multista and articles (multista and articles (multista tance or preparation n/to vessels/large con- tance or preparation ls/ large containers a preparation into small ding weighing) n or brushing cles by dipping and p gh energy conditions	uch or in exposure n occasional s or esis) where es for age and/or ntainers at (charging/ at dedicated Il containers pouring and in partly
Environmental release category	: <b>ERC4:</b> Industrial use of proproducts, not becoming pa	cessing aids in proce t of articles	esses and
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Further information	: Covers the use in formulated MWFs/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.
2.1 Contributing sconario contro	lling onvironmental exposure for EPC4. Industrial use of
processing aids in processes an	d products, not becoming part of articles
(Msafe)	: 1.027,13 tonnes/day
Environment factors not influenced	by risk management
Flow rate	: 18.000 m3/d
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100
Other given operational conditions a	affecting environmental exposure
Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil	: 300 : 2 % : 0,003 % : 0 %
Technical conditions and measures Air	<ul> <li>/ Organizational measures</li> <li>Treat air emission to provide a typical removal efficiency of</li> </ul>
Water	<ul> <li>(%): (Effectiveness: 70 %)</li> <li>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):</li> <li>(Effectiveness: 96.8 %)</li> </ul>
Remarks	<ul> <li>Prevent discharge of undissolved substance to or recover from wastewater.</li> </ul>
Remarks Remarks	<ul><li>Do not apply industrial sludge to natural soils.</li><li>Sludge should be incinerated, contained or reclaimed.</li></ul>
Conditions and measures related to Flow rate of sewage treatment	municipal sewage treatment plant : 2.000 m3/d
Effectiveness (of a measure)	: 96,8 %
Conditions and measures related to Waste treatment	<ul> <li>external treatment of waste for disposal</li> <li>External treatment and disposal of waste should comply with applicable local and/or national regulations.</li> </ul>
2.2 Contributing scenario contro PROC4,, PROC7, PROC8a, PROC no likelihood of exposure, Use in exposure, Use in closed batch pr other process (synthesis) where blending in batch processes for and/or significant contact), Indus (charging/discharging) from/to ve Transfer of substance or prepara containers at dedicated facilities	Iling worker exposure for: PROC1, PROC2, PROC3, 28b,, PROC10, PROC13, PROC17: Use in closed process, a closed, continuous process with occasional controlled rocess (synthesis or formulation), Use in batch and opportunity for exposure arises, PROC 5: Mixing or formulation of preparations and articles (multistage strial spraying, Transfer of substance or preparation essels/large containers at non-dedicated facilities, attion (charging/ discharging) from/ to vessels/ large , Transfer of substance or preparation into small
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containers (d Treatment of in partly oper	ledicated filling articles by dip າ process	J line, includi ping and pou	ng weighing), Iring, Lubricat	Roller ap tion at hig	plication or h energy co	brushing, onditions and
Product chara Remarks	cteristics	: Liquio	d, vapour pressu	ure > 10 kPa	a at STP	
Amount used Remarks		: Not a	pplicable			
Frequency and Remarks	duration of use	e : Cove differ	rs daily exposur ently)	es up to 8 h	nours (unless	stated
Other operatio Remarks	nal conditions a	ffecting worke : Assu imple ambio	ers exposure mes a good bas mented., Assum ent temperature,	ic standard nes use at r , unless sta	of occupation not more than ted differently	al hygiene is 20°C above
Organizational Do not ingest. product. Ident with substanc contamination report any ski	I measures to pr If swallowed then ify potential areas e likely. Clean up i immediately. Pro n problems that m	event /limit rel n seek immedia s for indirect ski contamination/ ovide basic emp nay develop., N	eases, dispersing the medical assist n contact. Wea spills as soon as bloyee training to o other specific	ion and ex stance., Avo r gloves (te s they occu o prevent / r measures i	posure bid direct skin sted to EN374 r. Wash off an ninimise expo dentified.	contact with ) if hand contact y skin sures and to
3. Exposure e	estimation and	reference to	its source			
Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC4	EUSES		Freshwater		0,0843 µg/L	0,000759
			Marine water		0,0076 µg/L	0,000069
			Soil		0,0018 mg/kg	0,000497
			sediment		0,0034 mg/kg	0,000811
			Marine sediment		0,308 µg/kg	0,00074
ERC4: Indus 4. Guidance t by the Expos	trial use of proces to Downstream ure Scenario	ssing aids in pro	uate whether	ducts, not b	becoming part	of articles
1. Short title of	Exposure Scenar	io: <b>Metal worl</b>	king fluids / ro	olling oils	– Professio	nal
Main User G	roups	· SU 2	2: Professional	uses: Public	c domain (adm	ninistration.
Sector of use Subara Sector Se				ninistration,		
Process cate	gory	educa : PRO PRO	ation, entertainm C1: Use in close C2: Use in close	nent, service ed process, ed, continuo	es, craftsmen) no likelihood ous process wi	of exposure th occasional
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	<ul> <li>controlled exposure</li> <li>PROC3: Use in closed batch process (synthesis or formulation)</li> <li>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</li> <li>PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities</li> <li>: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li> <li>PROC10: Roller application or brushing</li> <li>PROC11: Non industrial spraying</li> <li>PROC13: Treatment of articles by dipping and pouring</li> <li>PROC17: Lubrication at high energy conditions and in partly open process</li> </ul>
Environmental release category :	<b>ERC8a, ERC8d, ERC9a, ERC9b:</b> Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems
Further information :	Covers the use in formulated MWFs including transfer operations, open and contained cutting/machining activities, automated and manual application of corrosion protections, draining and working on contaminated/ reject articles, and disposal of waste oils.
2.1 Contributing scenario controlli ERC9a, ERC9b: Wide dispersive in dispersive outdoor use of process of substances in closed systems, systems	ng environmental exposure for:ERC8a, ERC8d, idoor use of processing aids in open systems, Wide ing aids in open systems, Wide dispersive indoor use Wide dispersive outdoor use of substances in closed
(Msafe)	1,006 tonnes/day
Environment factors not influenced by Flow rate : Dilution Factor (River) : Dilution Factor (Coastal Areas) :	<b>y risk management</b> 18.000 m3/d 10 100
Other given operational conditions aff	ecting environmental exposure
Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil	300 60 % 5 % 5 %
Technical conditions and measures / Air	Organizational measures Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 0 %) Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)
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Remarks Remarks Remarks		: Preve from : Do no : Sludo	ent discharge of wastewater. ot apply industria ge should be inc	undissolved al sludge to inerated, co	d substance t natural soils. ontained or re	o or recover claimed.
Conditions on			, 	ment plan		
Flow rate of s	sewage treatment		) m3/d	iment plan	L	
Effectiveness	s (of a measure)	: 96,8	%			
Conditions and Waste treatm	<b>d measures rela</b> t nent	t <b>ed to external</b> : Exter applio	treatment of w nal treatment ar cable local and/o	a <b>ste for di</b> a nd disposal or national r	<b>sposal</b> of waste shor egulations.	uld comply with
likelihood of exposure, Us or preparatio facilities, Tra large contain containers (d Non industria high energy o	exposure, Use e in closed bat n (charging/dis nsfer of substa ers at dedicated edicated filling al spraying, Tre conditions and	in closed, co ch process ( scharging) fro ince or prepa d facilities, T line, includi eatment of art in partly ope	ntinuous pro synthesis or f om/to vessels ration (chargi ransfer of sul ng weighing), ticles by dippi	cess with formulatio /large con ing/ disch ostance o Roller ap ing and po	occasional occasional n), Transfe tainers at r arging) from r preparatic plication or puring, Lub	ocess, no controlled r of substance ion-dedicated m/ to vessels/ on into small brushing, rication at
Product chara	cteristics	· Liqui		$r_0 > 10 k P_0$	n at STD	
Remarks		. Liquit	a, vapour pressu			
Amount used Remarks : Not applicable						
Frequency and duration of use       : Covers daily exposures up to 8 hours (unless stated differently)					stated	
Other operatio Remarks	nal conditions a	ffecting worke : Assu imple ambio	ers exposure mes a good bas mented., Assum ent temperature	ic standard nes use at r , unless sta	of occupation not more than ted differently	nal hygiene is 20°C above ⁄.
Organizational Do not ingest. product. Ident with substance contamination report any skin	I measures to pr If swallowed the ify potential areas e likely. Clean up immediately. Pro n problems that m	event /limit rel n seek immedia s for indirect ski contamination/ ovide basic emp nay develop., N	eases, dispersi ate medical assis n contact. Wea spills as soon as oloyee training to o other specific	ion and exp stance., Avo r gloves (tes s they occu o prevent / r measures in	posure bid direct skin sted to EN374 r. Wash off an ninimise expo dentified.	contact with 4) if hand contact ny skin osures and to
3. Exposure e	estimation and	reference to	its source			
Environment						
Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC8a, ERC8d, ERC9a ERC9b	EUSES		Freshwater		0,175 µg/L	0,00158
			Marine water		0,0168 µg/L	0,000151
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1	l	Soil	0,0058 mg/kg	0,00162
		Freshwater sediment	0,0071 mg/kg	0,00169
		Marine sedime	nt 0,0007 mg/kg	0,000161
		Air	0,271 µg/m3	

ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems

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

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	<b>PROC1:</b> Use in closed process, no likelihood of exposure
	<b>PROC2:</b> Use in closed, continuous process with occasional
	controlled exposure
	FROC3: Use in closed batch process (synthesis or
	Iormulation)
	(charging/discharging) from the vessels/large containers of
	non-dedicated facilities
	PROC8b: Transfer of substance or preparation (charging/
	discharging) from/ to vessels/ large containers at dedicated
	facilities
	<b>PROC16:</b> Using material as fuel sources, limited exposure to
	unburned product to be expected
Environmental release category	ERC7: Industrial use of substances in closed systems
Further information	
	Covers the use as a fuel (or fuel additive) and includes
	activities associated with its transfer, use, equipment
	maintenance and handling of waste.
2.1 Contributing scenario controll	ing environmental exposure for:ERC7: Industrial use of
substances in closed systems	
(Msafe)	· 1 484 848 toppes/day
(Mode)	. 1.+0+,0+0 tolines/day
Environment factors not influenced b	y risk management
Flow rate	: 18.000 m3/d
Dilution Factor (River)	: 10 · 100
Dilution Factor (Coastal Areas)	. 100
Other given operational conditions af	fecting environmental exposure
Number of emission days per year	: 300
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Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil	: 5 % : 0,001 % : 0 %
Technical conditions and measures Air	<ul> <li>/ Organizational measures</li> <li>: Treat air emission to provide a typical removal efficiency of</li> </ul>
Water	<ul> <li>(%): (Effectiveness: 95 %)</li> <li>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):</li> <li>(Effectiveness: 96.8 %)</li> </ul>
Remarks	: Prevent discharge of undissolved substance to or recover from wastewater.
Remarks Remarks	<ul><li>Do not apply industrial sludge to natural soils.</li><li>Sludge should be incinerated, contained or reclaimed.</li></ul>
Conditions and measures related to Flow rate of sewage treatment	municipal sewage treatment plant : 2.000 m3/d
Effectiveness (of a measure)	: 96,8 %
Conditions and measures related to Waste treatment	<ul> <li>external treatment of waste for disposal</li> <li>External treatment and disposal of waste should comply with applicable local and/or national regulations.</li> </ul>
closed, continuous process with process (synthesis or formulatio (charging/discharging) from/to ve Transfer of substance or prepara containers at dedicated facilities, unburned product to be expected	occasional controlled exposure, Use in closed batch n), Transfer of substance or preparation essels/large containers at non-dedicated facilities, ition (charging/ discharging) from/ to vessels/ large , Using material as fuel sources, limited exposure to
Product characteristics Remarks	: Liquid, vapour pressure > 10 kPa at STP
Amount used Remarks	: Not applicable
Frequency and duration of use Remarks	: Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affectin Remarks	<ul> <li>ng workers exposure</li> <li>Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.</li> </ul>
Organizational measures to prevent Do not ingest. If swallowed then seek product. Identify potential areas for in with substance likely. Clean up conta contamination immediately. Provide b report any skin problems that may de	/limit releases, dispersion and exposure immediate medical assistance., Avoid direct skin contact with direct skin contact. Wear gloves (tested to EN374) if hand contact mination/spills as soon as they occur. Wash off any skin basic employee training to prevent / minimise exposures and to velop., No other specific measures identified.
3. Exposure estimation and reference	ence to its source
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#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC7	EUSES		Freshwater		0,0582 µg/L	0,000525
			Marine water		0,005 µg/L	0,000045
			Soil		0,0006 mg/kg	0,000168
			Freshwater sediment		0,0023 mg/kg	0,000561
			Marine sediment		0,203 µg/kg	0,000049
			Air		0 565 µa/m3	

ERC7: Industrial use of substances in closed systems

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

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       :       SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)         Process category       :       SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)         Process category       :       PROC1: Use in closed process, outinuous process with occasional controlled exposure         PROC2: Use in closed batch process (synthesis or formulation)       PROC3: Use in closed facilities         PROC8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at anon-dedicated facilities         PROC16: Using material as fuel sources, limited exposure t unburned product to be expected         Environmental release category       :       ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems         Further information       :       :       Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive outdoor use of substances in closed systems       (Maife)       : 3,899 tonnes/day         SDS Number:10000006873	1 Short title of Exposure Scenario: Lise	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 process, no likelihood of exposure PROC3: Use in closed process (synthesis or formulation)         PROC3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities         PROC4: Using material as fuel sources, limited exposure t unburned product to be expected         Environmental release category       : ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems         Further information       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive outdoor use of substances in closed systems         (Msafe)       : 3,899 tonnes/day	T. Short the of Exposure Scenario. Use	
Sector of use       education, entertainment, services, craftsmen)         Process category       SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)         Process category       PROC1: Use in closed process, no likelihood of exposure PROC3: Use in closed, continuous process with occasional controlled exposure Ormulation)         PROC3: Use in closed process, no likelihood of exposure PROC3: Use in closed batch process (synthesis or formulation)         PROC3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities         PROC68b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities         PROC61: Using material as fuel sources, limited exposure to unburned product to be expected         Environmental release category       ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems. Wide dispersive outdoor use of substances closed systems         Further information       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive outdoor use of substances in closed systems         (Msafe)       : 3,899 tonnes/day         SDS Number:100000068730       39/48	Main User Groups	: SU 22: Professional uses: Public domain (administration,
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 process, no likelihood of exposure PROC3: Use in closed batch process (synthesis or formulation)         PROC3: Use in closed batch process (synthesis or formulation)       PROC3: Use in closed batch process (synthesis or formulation)         PROC3: Use in closed batch process (synthesis or formulation)       PROC3: Use in closed batch process (synthesis or formulation)         PROC3: Use in closed batch process (synthesis or formulation)       PROC3: Use in closed batch process (synthesis or formulation)         PROC3: Use in closed batch process (synthesis or formulation)       PROC3: Use in closed batch process, no likelihood of exposure at non-dedicated facilities         PROC4: Using material as fuel sources, limited exposure to unburned product to be expected       PROC1: Using material as fuel sources, limited exposure to unburned product to be expected         Environmental release category       :       ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems         Further information       :       Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive outdoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems, Wide dispersive outdo		education, entertainment, services, craftsmen)
Process category       education, entertainment, services, craftsmen)         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) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC7b: Using material as fuel sources, limited exposure t unburned product to be expected         Environmental release category       :       ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems, Wide dispersive outdoor use of substances closed systems         Further information       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       :       3,899 tonnes/day         SDS Number:10000068730       39/48	Sector of use	: SU 22: Professional uses: Public domain (administration,
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) 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 tunburned product to be expected         Environmental release category       : ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems, Wide dispersive outdoor use of substances closed systems         Further information       : Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       : 3,899 tonnes/day         SDS Number:10000068730       39/48		education, entertainment, services, craftsmen)
PROC2: Use in closed, continuous process with occasional controlled exposure         PROC3: Use in closed batch process (synthesis or formulation)         PROC3: 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         PROC7b: Using material as fuel sources, limited exposure to unburned product to be expected         Environmental release category       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive outdoor use of substances in closed systems         (Msafe)       :       3,899 tonnes/day         SDS Number:100000068730       39/48	Process category	: <b>PROC1:</b> Use in closed process, no likelihood of exposure
PROC3: Use in closed batch process (synthesis or formulation)         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         PROC7: Using material as fuel sources, limited exposure t unburned product to be expected         Environmental release category       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure		<b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure
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         Environmental release category       :       ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems, Wide dispersive outdoor use of substances closed systems         Further information       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       :         SDS Number:100000068730       39/48		<b>PROC3:</b> Use in closed batch process (synthesis or formulation)
(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         Environmental release category       :         ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems, Wide dispersive outdoor use of substances closed systems         Further information       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive outdoor use of substances in closed systems, Wide dispersive outdoor use of substances of substances in closed systems         (Msafe)       :         3,899 tonnes/day         SDS Number:100000068730       39/48		<b>PROC8a:</b> Transfer of substance or preparation
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         Environmental release category       :         ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems, Wide dispersive outdoor use of substances closed systems         Further information       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       :       3,899 tonnes/day         SDS Number:100000068730       39/48		(charging/discharging) from/to vessels/large containers at non-dedicated facilities
discharging) from/ to vessels/ large containers at dedicated facilities         PROC16: Using material as fuel sources, limited exposure tunburned product to be expected         Environmental release category       :         ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems, Wide dispersive outdoor use of substances closed systems         Further information       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive outdoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       :         SDS Number:10000068730       39/48		<b>PROC8b:</b> Transfer of substance or preparation (charging/
PROC16: Using material as fuel sources, limited exposure t         unburned product to be expected         Environmental release category       :         ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems, Wide dispersive outdoor use of substances closed systems         Further information       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       :         SDS Number:100000068730       39/48		discharging) from/ to vessels/ large containers at dedicated facilities
unburned product to be expected         Environmental release category       :         Environmental release category       :         Environmental release category       :         Further information       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive outdoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       :         SDS Number:100000068730       39/48		<b>PROC16:</b> Using material as fuel sources, limited exposure to
Environmental release category       :       ERC9a, ERC9b: Wide dispersive indoor use of substances closed systems, Wide dispersive outdoor use of substances closed systems         Further information       :       Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       :       3,899 tonnes/day         SDS Number:10000068730       39/48		unburned product to be expected
Further information       :         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems (Msafe)         (Msafe)       :         39/48	Environmental release category	: <b>ERC9a, ERC9b:</b> Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         (Msafe)       : 3,899 tonnes/day         SDS Number:100000068730       : 39/48	Furtherinformation	
Covers the use as a rule (of rule additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.         2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       : 3,899 tonnes/day         SDS Number:100000068730       39/48	Further Information	Covers the use on a fuel (or fuel additive) and includes
2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems (Msafe) : 3,899 tonnes/day SDS Number:100000068730 39/48		activities associated with its transfer, use, equipment maintenance and handling of waste.
2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       : 3,899 tonnes/day         SDS Number:100000068730       39/48		
2.1 Contributing scenario controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       : 3,899 tonnes/day         SDS Number:100000068730       39/48		
dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems         (Msafe)       : 3,899 tonnes/day         SDS Number:100000068730       39/48	2.1 Contributing scenario controll	ing environmental exposure for:ERC9a, ERC9b: Wide
substances in closed systems         (Msafe)       : 3,899 tonnes/day         SDS Number:100000068730       39/48	dispersive indoor use of substance	ces in closed systems, Wide dispersive outdoor use of
(Msafe)       : 3,899 tonnes/day         SDS Number:10000068730       39/48	substances in closed systems	
SDS Number:10000068730 39/48	(Msafe)	: 3,899 tonnes/day
	SDS Number 10000068730	39/48
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Environment factors not influenced I	by risk management
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100
Other given operational conditions a	ffecting environmental exposure
Number of emission days per year	: 300
Emission or Release Factor: Air	: 1%
Emission or Release Factor: Water	: 0,001 % : 0,001 %
Emission of Release Factor, Soli	. 0,001 //
Technical conditions and measures	Organizational measures
Air	: Treat air emission to provide a typical removal efficiency of
Water	(%): (Effectiveness: 0 %) : Treat onsite wastewater (prior to receiving water discharge) to
Water	provide the required removal efficiency of $\geq$ (%):
	(Effectiveness: 96,8 %)
Remarks	: Prevent discharge of undissolved substance to or recover
Remarks	from wastewater.
Remarks	: Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to	municipal sewage treatment plant
Flow rate of sewage treatment	: 2.000 m3/d
Effectiveness (of a measure)	: 96,8 %
Conditions and measures related to	external treatment of waste for disposal
vvaste treatment	: External treatment and disposal of waste should comply with applicable local and/or national regulations
2.2 Contributing scenario control PROC8a, PROC8b, PROC16: Use	ling worker exposure for: PROC1, PROC2, PROC3, in closed process, no likelihood of exposure, Use in
process (synthesis or formulation	a) Transfer of substance or preparation
(charging/discharging) from/to ve	essels/large containers at non-dedicated facilities.
Transfer of substance or prepara	tion (charging/ discharging) from/ to vessels/ large
containers at dedicated facilities,	Using material as fuel sources, limited exposure to
unburned product to be expected	
Product characteristics	Liquid veneur pressure + 10 kDs at STD
Remarks	. Liquid, vapour pressure > 10 kPa at STP
Amount used	
Remarks	: Not applicable
Frequency and duration of use	
Remarks	: Covers daily exposures up to 8 hours (unless stated
	differently)
Other operational conditions affectin	g workers exposure
Remarks	implemented. Assumes use at not more than 20°C above
	ambient temperature, unless stated differently.
Organizational measures to prevent	nimit releases, dispersion and exposure
SDS Number:10000068720	
3D3 Nullibel. 10000000730	40/48

#### SAFETY DATA SHEET

## AlphaPlus® 1-Hexene

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Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.

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

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC9a, ERC9b	EUSES		Freshwater		0,0452 µg/L	0,000408
			Marine water		0,0037 µg/L	0,000034
			Soil		0,0092 µg/kg	0,000003
			Freshwater sediment		0,0018 mg/kg	0,000436
			Marine sediment		0,15 µg/kg	0,000036
			Air		0,0045 µg/m3	

ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems

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

1. Short title of Exposure Scenario: Fund	ctional Fluids - Industria
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Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: <b>SU3:</b> Industrial Manufacturing (all)
Process category	<ul> <li>PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure</li> </ul>
	<b>PROC3:</b> Use in closed batch process (synthesis or formulation)
	<b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC8a:</b> Transfer of substance or preparation
	(charging/discharging) from/to vessels/large containers at
	<b>PROC8b:</b> 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)
Environmental release category	: ERC7: Industrial use of substances in closed systems
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.
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2.1 Contributing scenario controlling environmental exposure for:ERC7: Industrial use of								
substances in closed systems								
(Msafe)	: 1.027,13 tonnes/day							
Environment factors not influenced by risk management								
Flow rate	· 18 000 m3/d							
Dilution Factor (River)	· 10.000 ms/d							
Dilution Factor (Coastal Areas)	: 100							
Other given operational conditions affecting environmental exposure								
Number of emission days per year	: 300							
Emission or Release Factor: Air	: 1%							
Emission or Release Factor: Water	: 0,003 %							
Emission or Release Factor: Soil	: 0,3 %							
Technical conditions and measures	Organizational measures							
Air	: Treat air emission to provide a typical removal efficiency of							
Water	(%): (Effectiveness: 0%)							
water	Freat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96.8 %)							
Remarks	: Prevent discharge of undissolved substance to or recover from wastewater.							
Remarks	: Do not apply industrial sludge to natural soils.							
Remarks	: Sludge should be incinerated, contained or reclaimed.							
Conditions and measures related to Flow rate of sewage treatment plant effluent	municipal sewage treatment plant : 2.000 m3/d							
Effectiveness (of a measure)	: 96,8 %							
Conditions and measures related to Waste treatment	<ul> <li>external treatment of waste for disposal</li> <li>External treatment and disposal of waste should comply with applicable local and/or national regulations.</li> </ul>							
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, Transfer of substance or preparation into small containers (dedicated filling line, including weighing)								
Product characteristics Remarks	: Liquid, vapour pressure > 10 kPa at STP							
Amount used Remarks	: Not applicable							
Frequency and duration of use Remarks	: Covers daily exposures up to 8 hours (unless stated							
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#### differently)

#### Other operational conditions affecting workers exposure

Remarks

: Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

#### Organizational measures to prevent /limit releases, dispersion and exposure

Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.

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

#### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC7	EUSES		Freshwater		0,0843 µg/L	0,000759
			Marine water		0,0076 µg/L	0,000069
			Soil		0,0018 mg/kg	0,000503
			Freshwater		0,0034 mg/kg	0,000811
			sediment			
			Marine sediment		0,308 µg/kg	0,000074
			Air		0,0023 mg/m3	

ERC7: Industrial use of substances in closed systems

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

#### 1. Short title of Exposure Scenario: Functional Fluids - Professional

Main User Groups       :         Sector of use       :         Process category       :	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen) SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen) 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) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities : Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems
Environmental release category :	<b>ERC9a, ERC9b:</b> Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in
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	closed systems
Eurther information	
	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.
2.1 Contributing scenario contro dispersive indoor use of substan substances in closed systems	lling environmental exposure for:ERC9a, ERC9b: Wide ices in closed systems, Wide dispersive outdoor use of
(Msafe)	: 1,604 tonnes/day
Environment factors not influenced	by risk management
Flow rate	: 18.000 m3/d
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100
Other given operational conditions a	affecting environmental exposure
Number of emission days per year	: 300
Emission or Release Factor: Air	: 5%
Emission or Release Factor: Water	: 2,5 %
Emission or Release Factor: Soil	: 2,5 %
Technical conditions and measures	/ Organizational measures
Air	: Treat air emission to provide a typical removal efficiency of
	(%): (Effectiveness: 0 %)
Water	: I reat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq$ (%):
Pomorko	(Effectiveness: 96,8%)
Remarks	from wastewater
Remarks	: Do not apply industrial sludge to natural soils.
Remarks	: Sludge should be incinerated, contained or reclaimed.
Conditions and massures related to	municipal sowage treatment plant
Flow rate of sewage treatment	: 2.000 m3/d
plant effluent	
Effectiveness (of a measure)	: 96,8 %
Conditions and measures related to	external treatment of waste for disposal
Waste treatment	: External treatment and disposal of waste should comply with applicable local and/or national regulations
2.2 Contributing scenario control	lling worker exposure for: PROC1, PROC2, PROC3,
continuous process with occasion	a process, no internood of exposure, Use in closed, anal controlled exposure. Use in closed batch process
(synthesis or formulation). Trans	fer of substance or preparation (charging/discharging)
from/to vessels/large containers	at non-dedicated facilities, Transfer of substance or
preparation into small containers	s (dedicated filling line, including weighing), Heat and
pressure transfer fluids in disper	sive, professional use but closed systems
Product characteristics	
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Remarks		: Liqui	: Liquid, vapour pressure > 10 kPa at STP				
Remarks		: Not a	: Not applicable				
Frequency and Remarks	duration of use	e : Cove differ	: Covers daily exposures up to 8 hours (unless stated differently)				
<b>)ther operation</b> Remarks	al conditions a	ffecting work : Assu imple ambi	ers exposure imes a good bas emented., Assun ent temperature	ic standard nes use at r , unless sta	of occupation not more than ted differently	al hygiene is 20°C above	
Do not ingest. I product. Identif with substance contamination report any skin	If swallowed the y potential areas likely. Clean up immediately. Pro problems that n	n seek immedia s for indirect sk contamination ovide basic em nay develop., N	ate medical assist in contact. Wea /spills as soon a ployee training to lo other specific	stance., Avo r gloves (te s they occu o prevent / r measures i	posure bid direct skin sted to EN374 r. Wash off ar minimise expo dentified.	contact with I) if hand contac by skin Isures and to	
. Exposure e	stimation and	reference to	its source				
Environment							
Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio	
ERC9a, ERC9b	EUSES		Freshwater		0,110 µg/L	0,000994	
			Marine water		0,0102 µg/L	0,000092	
			Soll		0,0029 mg/kg	0,000812	
			sediment		0,0044 mg/kg	0,00106	
			Marine sediment		0.413 µa/ka	0.000099	
			Air		0,0226 µg/m3	0,000000	
ERC9b: Wide	o Downstream The Scenario	oor use of subs	tances in closed	l systems he works	inside the b	ooundaries se	
. Short title of E	xposure Scenar	io: <b>Use in po</b> l	ymer product	ion – indu	strial		
Main User Gro	oups	: SU 3	: Industrial uses	: Uses of su	ubstances as s	such or in	
Sector of use       SU3, SU 10: Industrial Manufacturing (all), Formulation         [mixing] of preparations and/ or re-packaging (excluding						rmulation (excluding	
Process categ	ory	: PRO PRO contr PRO form PRO	<b>C1</b> : Use in close <b>C2</b> : Use in close olled exposure <b>C3</b> : Use in close ulation) <b>C4</b> : Use in batch	ed process, ed, continuc ed batch pro	no likelihood ous process wi ocess (synthes process (synt	of exposure ith occasional sis or hesis) where	

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	opportunity for exposure arises : PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) <b>PROC6:</b> Calendering operations <b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC14:</b> Production of mixtures or articles by tabletting, compression, extrusion, pelletization; Industrial setting; <b>PROC15:</b> Use as laboratory reagent
Environmental release category	: <b>ERC4, ERC6c:</b> Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of monomers for manufacture of thermoplastics
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).
Inductrial use of proposing aid	s in processes and products, not becoming part of
Industrial use of processing aid articles, Industrial use of monor (Msafe)	s in processes and products, not becoming part of ners for manufacture of thermoplastics : 171,467 tonnes/day
Industrial use of processing aid articles, Industrial use of monor (Msafe) Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas)	<ul> <li>in processes and products, not becoming part of ners for manufacture of thermoplastics</li> <li>171,467 tonnes/day</li> <li>by risk management <ul> <li>18.000 m3/d</li> <li>10</li> <li>100</li> </ul> </li> </ul>
Industrial use of processing aid articles, Industrial use of monor (Msafe) Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions	<ul> <li>in processes and products, not becoming part of ners for manufacture of thermoplastics</li> <li>171,467 tonnes/day</li> <li>by risk management <ul> <li>18.000 m3/d</li> <li>10</li> <li>100</li> </ul> </li> <li>affecting environmental exposure</li> </ul>
Industrial use of processing aid articles, Industrial use of monor (Msafe) Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil	<ul> <li>in processes and products, not becoming part of ners for manufacture of thermoplastics</li> <li>171,467 tonnes/day</li> <li>by risk management <ul> <li>18.000 m3/d</li> <li>10</li> <li>100</li> </ul> </li> <li>affecting environmental exposure</li> <li>300 <ul> <li>1%</li> <li>0,03 %</li> <li>0,01 %</li> </ul> </li> </ul>
Industrial use of processing aid articles, Industrial use of monor (Msafe) Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil Technical conditions and measures Air	<ul> <li>in grocesses and products, not becoming part of ners for manufacture of thermoplastics</li> <li>171,467 tonnes/day</li> <li>by risk management <ul> <li>18.000 m3/d</li> <li>10</li> </ul> </li> <li>affecting environmental exposure</li> <li>300</li> <li>1 %</li> <li>0,03 %</li> <li>0,01 %</li> </ul> <li>b / Organizational measures <ul> <li>Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 80 %)</li> </ul> </li>
Industrial use of processing aid articles, Industrial use of monor (Msafe) Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil Technical conditions and measures Air Water	<ul> <li>in processes and products, not becoming part of ners for manufacture of thermoplastics</li> <li>: 171,467 tonnes/day</li> <li>by risk management <ul> <li>: 18.000 m3/d</li> <li>: 10</li> </ul> </li> <li>affecting environmental exposure</li> <li>: 300</li> <li>: 1 %</li> <li>: 0,03 %</li> <li>: 0,01 %</li> </ul> <li>5/ Organizational measures <ul> <li>: Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 80 %)</li> <li>: Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)</li> </ul> </li>
Industrial use of processing aid articles, Industrial use of monor (Msafe) Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil Technical conditions and measures Air Water Remarks Remarks Remarks	<ul> <li>sin processes and products, not becoming part of mers for manufacture of thermoplastics</li> <li>171,467 tonnes/day</li> <li>by risk management <ul> <li>18,000 m3/d</li> <li>10</li> <li>100</li> </ul> </li> <li>affecting environmental exposure</li> <li>300 <ul> <li>1%</li> <li>0,03 %</li> <li>0,01 %</li> </ul> </li> <li>f/ Organizational measures <ul> <li>Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 80 %)</li> <li>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)</li> <li>Prevent discharge of undissolved substance to or recover from wastewater.</li> <li>Do not apply industrial sludge to natural soils.</li> <li>Sludge should be incinerated contained or reclaimed</li> </ul> </li> </ul>
Industrial use of processing aid articles, Industrial use of monor (Msafe) Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil Technical conditions and measures Air Water Remarks Remarks Remarks Conditions and measures related to Flow rate of sewage treatment	<ul> <li>in processes and products, not becoming part of ners for manufacture of thermoplastics</li> <li>: 171,467 tonnes/day</li> <li>by risk management <ul> <li>: 18,000 m3/d</li> <li>: 10</li> </ul> </li> <li>affecting environmental exposure</li> <li>: 300</li> <li>: 1 %</li> <li>: 0,03 %</li> <li>: 0,01 %</li> </ul> <li>5/ Organizational measures <ul> <li>: Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 80 %)</li> <li>: Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)</li> <li>: Prevent discharge of undissolved substance to or recover from wastewater.</li> <li>: Do not apply industrial sludge to natural soils.</li> <li>: Sludge should be incinerated, contained or reclaimed.</li> </ul> </li>

					SAFE	TY DATA SHEET		
Alpharius® 1-Hexene								
Version 3.5					Revision	Date 2016-05-22		
plant effluent Effectiveness	plant effluent Effectiveness (of a measure) : 96,8 %							
Conditions and measures related to external treatment of waste for disposal         Waste treatment       : External treatment and disposal of waste should comply with applicable local and/or national regulations.								
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4,, PROC6, 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, 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 tabletting, compression, extrusion, pelletization; Industrial setting;, Use as laboratory reagent								
Product chara Remarks	cteristics	: Liqu	id, vapour pressu	ure > 10 kPa	a at STP			
Amount used Remarks	Amount used Remarks : Not applicable							
Frequency and Remarks	Frequency and duration of use       : Covers daily exposures up to 8 hours (unless stated differently)							
Other operational conditions affecting workers exposure         Remarks       : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.								
Organizational measures to prevent /limit releases, dispersion and exposure Do not ingest. If swallowed then seek immediate medical assistance., 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., No other specific measures identified.								
Environment								
Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio		
ERC4, ERC6c	EUSES		Freshwater		0,0391 mg/L	0,352		
			Soil		1,72 mg/kg	0,0352		
			Freshwater		1,58 mg/kg	0,376		
			Marine sediment		0,157 mg/kg	0,0376		
ERC4: Indus ERC6c: Indu	Air         0,0452 mg/m3           ERC4: Industrial use of processing aids in processes and products, not becoming part of articles           ERC6: Industrial use of monomers for manufacture of thermoplastics							
SDS Number:100000068730 47/48								

Version 3.5

Revision Date 2016-05-22

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

SDS Number:100000068730