


AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

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

Trade name : AlphaPlus® 1-Hexene (C₆H₁₂)
 Material : 10576539

EC-No.Registration number

Chemical Name	CAS-No. EC-No. Index No.	Legal Entity Registration number
1-Hexene	592-41-6 209-753-1	Qatar Chemical Company LTD (Q-Chem) 01-2119475505-34-0002
1-Hexene	592-41-6 209-753-1	Qatar Chemical Company LTD (Q-Chem) 01-2119475505-34-0003

Relevant Identified Uses : Manufacture
 Supported Distribution
 Use as an intermediate
 Formulation
 Lubricants - Industrial
 Lubricants - Professional
 Lubricants - Consumer
 Metal working fluids / rolling oils - Industrial
 Metal working fluids / rolling oils – Professional
 Use as a fuel - industrial
 Use as a fuel – professional
 Functional Fluids - Industrial
 Functional Fluids - Professional
 Use in polymer production – industrial

Company : Qatar Chemical Company LTD (QChem)
 1st Floor Salam Tower Al Corniche
 P.O. Box 24646
 Doha, Qatar

MSDS Requests: (+974) 4484-7110
 Technical Information: (+974) 4476-7676
 Responsible Party: Product Safety Group
 Email: MSDSInquiry@qchem.com.qa

Local : Chevron Phillips Chemicals International N.V.
 Brusselsesteenweg 355
 B-3090 Overijse
 Belgium

MSDS Requests: (800) 852-5530
 Technical Information: (832) 813-4862
 Responsible Party: Product Safety Group

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

Email:msds@cpchem.com

Emergency telephone:**Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

Transport:

North America: CHEMTREC 800.424.9300 or 703.527.3887

Asia: +800 CHEMCALL (+800 2436 2255)

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

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

Responsible Department : Product Safety and Toxicology Group
 E-mail address : MSDS@CPChem.com
 Website : www.CPChem.com

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

Flammable liquids , Category 2

H225:

Highly flammable liquid and vapor.

Aspiration hazard , Category 1

H304:

May be fatal if swallowed and enters airways.

Classification (67/548/EEC, 1999/45/EC)

Highly flammable

R11:

Highly flammable.

Harmful

R65:

Harmful: may cause lung damage if swallowed.

Dangerous for the environment

R66:

Repeated exposure may cause skin dryness or cracking.

R51/53:

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Label elements**Labeling (REGULATION (EC) No 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 flames/hot surfaces. - No smoking.

P243

Take precautionary measures against static discharge.

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

P280

Wear protective gloves/ protective clothing/
eye protection/ face protection.**Response:**
P301 + P310IF SWALLOWED: Immediately call a
POISON CENTER or doctor/ physician.
Do NOT induce vomiting.

P331

Storage:
P403 + P235

Store in a well-ventilated place. Keep cool.

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 (67/548/EEC)	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
1-Hexene	592-41-6 209-753-1	F-Xn-N; R11-R65- R51/53-R66	Asp. Tox. 1; H304 Flam. Liq. 2; H225	99 - 100
2-Ethyl-1-Butene	760-21-4 212-078-5		Asp. Tox. 1; H304 Flam. Liq. 2; H225	0 - 5

For the full text of the R-phrases mentioned in this Section, see Section 16.

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

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

- 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.

SECTION 5: Firefighting measures

- 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 fire fighting 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 measures

- 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.

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

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**

Advice on safe handling : Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary, but may not by themselves be sufficient. Review all operations, which have the potential to generating and accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106 "Flammable and Combustible Liquids"; National Fire Protection Association (NFPA 77), "Recommended Practice on Static Electricity"; and/or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising Out of Static, Lightning, and stray Currents".

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

Storage

Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

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

Componentes	Bases	Valor	Parâmetros de controlo	Nota
1-HEXENE	PT OEL	VLE-MP	50 ppm,	

BE

Bestanddelen	Basis	Waarde	Controleparameters	Opmerking
1-HEXENE	BE OEL	TGG 8 hr	50 ppm, 175 mg/m ³	

Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits.

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

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 Exposure Scenario in the Annex portion

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

- Form : Liquid
Physical state : Liquid
Color : Clear, colorless

Safety data

- Flash point : -26 °C (-15 °F)
Method: closed cup
Lower explosion limit : 2 %(V)
Upper explosion limit : 7 %(V)

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

Oxidizing properties	: no
Autoignition temperature	: 272 °C (522 °F)
Molecular formula	: C ₆ H ₁₂
Molecular Weight	: 84,18 g/mol
pH	: 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, 15 °C(59 °F)
Density	: 645 kg/m ³ at 50 °C (122 °F) 678 kg/m ³ at 15 °C (59 °F) 674 g/cm ³ at 20 °C (68 °F)
Water solubility	: 47 MG/L at 20 °C (68 °F) slightly soluble
Partition coefficient: n-octanol/water	: 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 %

Other information

Conductivity	: 4,1 pSm Method: ASTM D4308
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SECTION 10: Stability and reactivity

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

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

Possibility of hazardous reactions

Conditions to avoid : Heat, flames and sparks.

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

SECTION 11: Toxicological information**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

Acute dermal toxicity

1-Hexene : LD50: > 2.000 mg/kg
Species: rabbit
Sex: male and female

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 (C₆H₁₂)

Sensitization : Did not cause sensitization on laboratory animals.

Repeated dose toxicity

1-Hexene : Species: rat, male
Sex: male
Application Route: oral gavage
Dose: 0, 10, 101, 1010, 3365 mg/kg
Exposure time: 28 day

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

Number of exposures: daily
 NOEL: 101 mg/kg
 Lowest observable effect level: 1.010 mg/kg
 Test substance: yes
 Method: OECD Test Guideline 407

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

AlphaPlus® 1-Hexene (C6H12)**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

: Carcinogenicity: Not available
 Mutagenicity: Tests on bacterial or mammalian cell cultures

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

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.

AlphaPlus® 1-Hexene (C₆H₁₂)

Further information : Solvents may degrease the skin.

SECTION 12: Ecological information**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 other aquatic invertebrates

1-Hexene : EC50: 4,4 mg/l
 Exposure time: 48 h
 Species: Daphnia magna (Water flea)
 static test Test substance: no
 Method: OECD Test Guideline 202
 Information given is based on data obtained from similar substances.

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.

Bioaccumulation

1-Hexene : This material is not expected to bioaccumulate.

Biodegradability

1-Hexene : 67 - 98 %
 Testing period: 28 d

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

Test substance: yes
According to the results of tests of biodegradability this product is considered as being readily biodegradable.

Acute aquatic toxicity

1-Hexene : Toxic to aquatic life.

1-Hexene :

1-Hexene :

1-Hexene :

1-Hexene :

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 considerations

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

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

Product : 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 the Exposure Scenario in the Annex portion

SECTION 14: Transport information

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

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

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

UN2370, 1-HEXENE, 3, II

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN2370, 1-HEXENE, 3, II, (-26 °C)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN2370, 1-HEXENE, 3, II

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

UN2370, 1-HEXENE, 3, II, (D/E)

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

UN2370, 1-HEXENE, 3, II

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

UN2370, 1-HEXENE, 3, II

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

SECTION 15: Regulatory information**National legislation**

Major Accident Hazard Legislation : 96/82/EC Update: 2003
 Highly flammable
 7b
 Quantity 1: 5.000 t
 Quantity 2: 50.000 t

Water contaminating class (Germany) : WGK 2 water endangering

Notification status

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

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

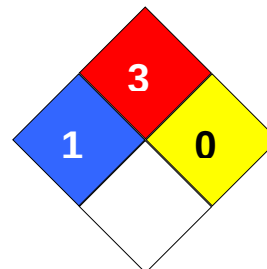
Revision Date 2014-01-21

China IECSC

: On the inventory, or in compliance with the inventory

SECTION 16: Other information

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

**Further information**

Legacy MSDS Number : QCHEM009

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

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

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

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

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

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

	on Cancer		
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

Full text of R-phrases referred to under sections 2 and 3

R11	Highly flammable.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65	Harmful: may cause lung damage if swallowed.
R66	Repeated exposure may cause skin dryness or cracking.

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.

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU3, SU8, SU9: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities PROC15: Use as laboratory reagent
Environmental release category	: ERC1, ERC4: 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 controlling environmental exposure for:ERC1, ERC4: Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles

Concentration of the Substance in : 100%
Mixture/Article

(Msafe) : 166,834 tonnes/day

Environment factors not influenced by risk management

Flow rate : 18.000 m3/d
Dilution Factor (River) : 40
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting 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 %

Technical conditions and measures / Organizational measures

MSDS Number:100000068731

15/48

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

Air	: Treat air emission to provide a typical removal efficiency of (%) (Effectiveness: 90 %)
Water	: Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq$ (%): (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	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
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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

Product characteristics

Concentration of the Substance in Mixture/Article	: 100%
Remarks	: Liquid, vapour pressure > 10 kPa at STP

Amount used

Remarks	: Not applicable
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Frequency and duration of use

Remarks	: Covers daily exposures up to 8 hours (unless stated differently)
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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.
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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**

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
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 sediment		0,809 mg/kg	0,193
			Marine sediment		0,323 mg/kg	0,0772
			Air		0,232 mg/m3	

ERC1: Manufacture of substances

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

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: Distribution

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU3: Industrial Manufacturing (all)
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities : Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Environmental release category	: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7: Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems

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 controlling environmental exposure for: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7: Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems

Concentration of the Substance in : 100%
Mixture/Article

(Msafe) : 5.011,707 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

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 / Organizational measures

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 90 %)

Water : Treat 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 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,

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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

Product characteristics

Concentration of the Substance in : 100%
Mixture/Article

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**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 sediment		0,055 mg/kg	0,0131
			Marine sediment		0,0055 mg/kg	0,0013
			Air		0,0023 mg/m3	

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

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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

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	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU3, SU8, SU9: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities PROC15: Use as laboratory reagent
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 controlling environmental exposure for:ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

Concentration of the Substance in Mixture/Article : 100%

(Msafe) : 166,837 tonnes/day

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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

Number of emission days per year : 300
 Emission or Release Factor: Air : 2,5 %
 Emission or Release Factor: Water : 0,03 %
 Emission or Release Factor: Soil : 0,1 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide a typical removal efficiency of (%) (Effectiveness: 80 %)
 Water : Treat 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 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 : 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, 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

Product characteristics

Concentration of the Substance in Mixture/Article : 100%

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.

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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
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 sediment		0,325 mg/kg	0,0776
			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

- Main User Groups : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
- 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)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

discharging) from/ to vessels/ large containers at dedicated facilities
 : Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14: Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;
PROC15: Use as laboratory reagent

Environmental release category : **ERC2:** Formulation of preparations

Further information : Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for:ERC2: Formulation of preparations

Concentration of the Substance in Mixture/Article : 100%

(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 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 (%): (Effectiveness: 0 %)
 Water : Treat 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 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 : 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,, PROC14, PROC15: Use in closed process, no likelihood of

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;; Use as laboratory reagent

Product characteristics

Concentration of the Substance in : 100%
Mixture/Article

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**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 sediment		1,08 mg/kg	0,258
			Marine sediment		0,108 mg/kg	0,0258
			Air		0,579 mg/m3	

ERC2: Formulation of preparations

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

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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 preparations at industrial sites
Sector of use	: SU3: Industrial Manufacturing (all)
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC7: Industrial spraying 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) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC17: Lubrication at high energy conditions and in partly open process PROC18: Greasing at high energy conditions
Environmental release category	: ERC4, ERC7: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of substances in closed systems
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 controlling environmental exposure for:ERC4, ERC7: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of substances in closed systems

Concentration of the Substance in Mixture/Article : 100%

(Msafe) : 805,271 tonnes/day

Environment factors not influenced by risk management

Flow rate : 18.000 m3/d
Dilution Factor (River) : 10

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Number of emission days per year : 300
 Emission or Release Factor: Air : 0,1 %
 Emission or Release Factor: Water : 0,003 %
 Emission or Release Factor: Soil : 0,1 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide a typical removal efficiency of (%) (Effectiveness: 70 %)
 Water : Treat 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 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 : 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 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

Concentration of the Substance in Mixture/Article : 100%

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

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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
ERC4, ERC7	EUSES		Freshwater		0,071 µg/L	0,0006
			Marine water		0,0063 µg/L	0,00006
			Soil		0,001 mg/kg	0,00032
			Freshwater sediment		0,0029 mg/kg	0,0007
			Marine sediment		0,254 µg/kg	0,00006
			Air		0,447 µg/m3	

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

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

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 - Professional

Main User Groups	: SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sector of use	: SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

	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) PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC17: Lubrication at high energy conditions and in partly open process PROC18: Greasing at high energy conditions PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems
Environmental release category	ERC8a, ERC8d, ERC9a, ERC9b: 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 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 controlling environmental exposure for:ERC8a, ERC8d, ERC9a, ERC9b: 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

Concentration of the Substance in Mixture/Article : 100%

(Msafe) : 0,873 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

Number of emission days per year : 300
Emission or Release Factor: Air : 60 %
Emission or Release Factor: Water : 5 %
Emission or Release Factor: Soil : 5 %

Technical conditions and measures / Organizational measures

Air : 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 ≥ (%): (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.

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

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, PROC8a, PROC8b,, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20:
 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), 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

Concentration of the Substance in : 100%
 Mixture/Article

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**Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC8a, ERC8d,	EUSES		Freshwater		0,131 µg/L	0,00118

MSDS Number:100000068731

29/48

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

ERC9a, ERC9b						
			Marine water		0,0123 µg/L	0,00011
			Soil		0,0038 mg/kg	0,00107
			Freshwater sediment		0,0053 mg/kg	0,00126
			Marine sediment		0,496 µg/kg	0,000119
			Air		0,179 µg/m ³	

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

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 - Consumer**

Main User Groups	: SU 21: Consumer uses: Private households (= general public = consumers)
Sector of use	: SU 21: Consumer uses: Private households (= general public = consumers)
Product category	: PC1: Adhesives, sealants PC24: Lubricants, greases, release products PC31: Polishes and wax blends
Environmental release category	: ERC8a, ERC8d, ERC9a, ERC9b: 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 controlling environmental exposure for:ERC8a, ERC8d, ERC9a, ERC9b: 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

Product characteristics

Concentration of the Substance in : 100%
 Mixture/Article

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

Remarks

(Msafe) : 0,804 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

Number of emission days per year : 365

Emission or Release Factor: Air : 60 %

Emission or Release Factor: Water : 5 %

Emission or Release Factor: Soil : 5 %

Technical conditions and measures / Organizational measures

Air : 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 ≥ (%) (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 : 2.000 m3/d

plant effluent

Effectiveness (of a measure) : 96,8 %

Procedures to limit air emissions :
from Sewage Treatment Plant**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 consumer exposure for: PC1, PC24, PC31: Adhesives, sealants, Lubricants, greases, release products, Polishes and wax blends**Product characteristics**

Concentration of the Substance in : 100%

Mixture/Article

Remarks

Remarks : Liquid, vapour pressure > 10 kPa at STP

Amount used

Remarks : Not applicable

Other given operational conditions affecting consumers 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.

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

Conditions and measures related to protection of consumer (e.g. behavioral advice, personal protection and hygiene)

Consumer Measures

: 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
ERC8a, ERC8d, ERC9a, ERC9b	EUSES		Freshwater		0,116 µg/L	0,00104
			Marine water		0,0108 µg/L	0,000097
			Soil		0,0031 mg/kg	0,000882
			Freshwater sediment		0,0047 mg/kg	0,00112
			Marine sediment		0,435 µg/kg	0,000104
			Air		0,147 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

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: Metal working fluids / rolling oils - Industrial

Main User Groups

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

Sector of use

: **SU3:** Industrial Manufacturing (all)

Process category

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

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC7: Industrial spraying
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
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC17: Lubrication at high energy conditions and in partly open process

Environmental release category : **ERC4:** Industrial use of processing aids in processes and products, not becoming part of articles

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 scenario controlling environmental exposure for: **ERC4: Industrial use of processing aids in processes and products, not becoming part of articles**

Concentration of the Substance in Mixture/Article : 100%

(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 affecting environmental exposure

Number of emission days per year : 300
Emission or Release Factor: Air : 2 %
Emission or Release Factor: Water : 0,003 %
Emission or Release Factor: Soil : 0 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 70 %)
Water : Treat 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

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

Remarks : 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 : 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, PROC8b,, PROC10, PROC13, PROC17: 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), 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

Product characteristics

Concentration of the Substance in : 100%
 Mixture/Article

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**Environment**

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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
			Freshwater sediment		0,0034 mg/kg	0,000811
			Marine sediment		0,308 µg/kg	0,000074
			Air		0,0013 mg/m3	

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**1. Short title of Exposure Scenario: Metal working fluids / rolling oils – Professional**

Main User Groups	:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sector of use	:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process category	:	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) 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) PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC17: Lubrication at high energy conditions and in partly open process
Environmental release category	:	ERC8a, ERC8d, ERC9a, ERC9b: 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 controlling environmental exposure for:ERC8a, ERC8d, ERC9a, ERC9b: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

of substances in closed systems, Wide dispersive outdoor use of substances in closed systems

Concentration of the Substance in : 100%
Mixture/Article

(Msafe) : 1,006 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

Number of emission days per year : 300
Emission or Release Factor: Air : 60 %
Emission or Release Factor: Water : 5 %
Emission or Release Factor: Soil : 5 %

Technical conditions and measures / Organizational measures

Air : 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 $\geq$ (%) (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 : 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, PROC8a, PROC8b,, PROC10, PROC11, PROC13, PROC17: 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), 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

Product characteristics

Concentration of the Substance in : 100%
Mixture/Article

Remarks : Liquid, vapour pressure > 10 kPa at STP

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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**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
			Soil		0,0058 mg/kg	0,00162
			Freshwater sediment		0,0071 mg/kg	0,00169
			Marine sediment		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 : **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

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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 expectedEnvironmental 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 controlling environmental exposure for:ERC7: Industrial use of substances in closed systems

Concentration of the Substance in Mixture/Article : 100%

(Msafe) : 1.484,848 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

Number of emission days per year : 300

Emission or Release Factor: Air : 5 %

Emission or Release Factor: Water : 0,001 %

Emission or Release Factor: Soil : 0 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 95 %)

Water : Treat 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 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 : 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, PROC8a, PROC8b, PROC16: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Transfer of substance or preparation

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

(charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics

Concentration of the Substance in Mixture/Article : 100%

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**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 µg/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: Use as a fuel – professional**

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

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

Sector of use	: SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) 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 in closed systems, Wide dispersive outdoor 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 controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems

Concentration of the Substance in Mixture/Article : 100%

(Msafe) : 3,899 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

Number of emission days per year : 300
Emission or Release Factor: Air : 1 %
Emission or Release Factor: Water : 0,001 %
Emission or Release Factor: Soil : 0,001 %

Technical conditions and measures / Organizational measures

Air : 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 ≥ (%): (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 : 2.000 m3/d

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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, PROC8a, PROC8b, PROC16: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics

Concentration of the Substance in : 100%
Mixture/Article

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**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

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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 - Industrial**

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

2.1 Contributing scenario controlling environmental exposure for:ERC7: Industrial use of substances in closed systems

Concentration of the Substance in Mixture/Article	: 100%
(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 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 (%): (Effectiveness: 0 %)
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AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

- Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq$ (%):
(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 : 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, 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

- Concentration of the Substance in : 100%
Mixture/Article
- 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**Environment**

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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 sediment		0,0034 mg/kg	0,000811
			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	: SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sector of use	: SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) 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	: ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems
Further 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 controlling environmental exposure for:ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems

Concentration of the Substance in Mixture/Article : 100%

(Msafe) : 1,604 tonnes/day

Environment factors not influenced by risk management

Flow rate : 18.000 m3/d

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

Dilution Factor (River) : 10
 Dilution Factor (Coastal Areas) : 100

Other given operational conditions 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 : Treat 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 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 : 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, PROC8a,, PROC20: 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), 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), Heat and pressure transfer fluids in dispersive, professional use but closed systems

Product characteristics

Concentration of the Substance in Mixture/Article : 100%

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

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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		0,110 µg/L	0,000994
			Marine water		0,0102 µg/L	0,000092
			Soil		0,0029 mg/kg	0,000812
			Freshwater sediment		0,0044 mg/kg	0,00106
			Marine sediment		0,413 µg/kg	0,000099
			Air		0,0226 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: Use in polymer production – industrial**

- Main User Groups : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
- Sector of use : **SU3, 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)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
: PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC6: Calendering operations
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities
PROC14: Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;
PROC15: Use as laboratory reagent
- Environmental release category : **ERC4, ERC6c:** Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of

AlphaPlus® 1-Hexene (C6H12)

Version 7.3

Revision Date 2014-01-21

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).

2.1 Contributing scenario controlling environmental exposure for:ERC4, ERC6c: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of monomers for manufacture of thermoplastics

Concentration of the Substance in Mixture/Article : 100%

(Msafe) : 171,467 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

Number of emission days per year : 300
 Emission or Release Factor: Air : 1 %
 Emission or Release Factor: Water : 0,03 %
 Emission or Release Factor: Soil : 0,01 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide a typical removal efficiency of (%) (Effectiveness: 80 %)
 Water : Treat 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 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 : 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

AlphaPlus® 1-Hexene (C₆H₁₂)

Version 7.3

Revision Date 2014-01-21

containers at dedicated facilities, Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting; Use as laboratory reagent

Product characteristics

Concentration of the Substance in Mixture/Article : 100%

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**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
			Marine water		0,0039 mg/L	0,0352
			Soil		1,72 mg/kg	0,486
			Freshwater sediment		1,58 mg/kg	0,376
			Marine sediment		0,157 mg/kg	0,0376
			Air		0,0452 mg/m3	

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

ERC6c: Industrial use of monomers for manufacture of thermoplastics

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