

**AlphaPlus® 1-Decene**

Version 2.9

Revision Date 2020-03-03

According to Regulation (EC) No. 1907/2006, Regulation (EC) No. 2015/830

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1****Product information**

Product Name : AlphaPlus® 1-Decene  
 Material : 1095875, 1068252, 1037000, 1015428, 1036999

**EC-No.Registration number**

Chemical name	CAS-No. EC-No. Index No.	Legal Entity Registration number
1-Decene	872-05-9 212-819-2	Chevron Phillips Chemical Company LP 01-2119486878-12-0006

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

Relevant Identified Uses Supported : Manufacture  
 Use as an intermediate  
 Formulation  
 Use in coatings – industrial  
 Use in coatings – professional  
 Use in Coatings - Consumer  
 Use in Oil and Gas field drilling and production operations - Industrial  
 Use in polymer production – industrial

**1.3****Details of the supplier of the safety data sheet**

**Company** : Chevron Phillips Chemical Company LP  
 Normal Alpha Olefins (NAO)  
 10001 Six Pines Drive  
 The Woodlands, TX 77380

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

SDS Requests: (800) 852-5530

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

**1.4****Emergency telephone:****Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

**Transport:**

CHEMTREC 800.424.9300 or 703.527.3887(int'l)

Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090

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

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

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

Argentina: +(54)-1159839431

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

**SECTION 2: Hazards identification****2.1****Classification of the substance or mixture  
REGULATION (EC) No 1272/2008**

Flammable liquids, Category 3

H226:

Flammable liquid and vapor.

Aspiration hazard, Category 1

H304:

May be fatal if swallowed and enters airways.

Short-term (acute) aquatic hazard,  
Category 1

H400:

Very toxic to aquatic life.

Long-term (chronic) aquatic hazard,  
Category 1

H410:

Very toxic to aquatic life with long lasting effects.

**2.2****Labeling (REGULATION (EC) No 1272/2008)**

Hazard pictograms

:



Signal Word

:

Danger

Hazard Statements

:

H226

Flammable liquid and vapor.

H304

May be fatal if swallowed and enters airways.

H410

Very toxic to aquatic life with long lasting effects.

Precautionary Statements

:

**Prevention:**

P210

Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.

P243

Take precautionary measures against static discharge.

P273

Avoid release to the environment.

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P280                   Wear protective gloves/ protective clothing/  
eye protection/ face protection.

**Response:**  
P301 + P310        IF SWALLOWED: Immediately call a  
                          POISON CENTER/ doctor.

P331                   Do NOT induce vomiting.

**Storage:**  
P403 + P235        Store in a well-ventilated place. Keep cool.

Hazardous ingredients which must be listed on the label:

- 872-05-9            1-Decene

**SECTION 3: Composition/information on ingredients****3.1 - 3.2****Substance or Mixture**

Synonyms            :   Decene-n-1  
                          NAO 10  
                          Decene-1 (C10)  
                          (C10 H20)

Molecular formula   :   C10H20

**Hazardous ingredients**

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
<b>1-Decene</b>	<b>872-05-9</b> <b>212-819-2</b>	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	96 - 100
2-Butyl-1-Hexene	6795-79-5	Flam. Liq. 3; H226 Asp. Tox. 1; H304	1 - 5
2-Ethyl-1-Octene	51655-64-2	Flam. Liq. 3; H226 Asp. Tox. 1; H304	1 - 5

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

**SECTION 4: First aid measures****4.1****Description of 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.

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- In case of skin contact : If on skin, rinse well with water. If on clothes, remove clothes.
- In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

**SECTION 5: Firefighting measures**

- Flash point : 49°C (120°F)
- Autoignition temperature : 210°C (410°F)

**5.1****Extinguishing media**

- Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO<sub>2</sub>). Dry chemical.
- Unsuitable extinguishing media : High volume water jet.

**5.2****Special hazards arising from the substance or mixture**

- Specific hazards during fire fighting : Do not allow run-off from fire fighting to enter drains or water courses.

**5.3****Advice for firefighters**

- Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
- Fire and explosion protection : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.
- Hazardous decomposition products : Carbon oxides.

**SECTION 6: Accidental release measures****6.1****Personal precautions, protective equipment and emergency procedures**

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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.

**6.2****Environmental precautions**

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.

**6.3****Methods and materials for containment and cleaning up**

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).

**6.4****Reference to other sections**

Reference to other sections : For personal protection see section 8. For disposal considerations see section 13.

**SECTION 7: Handling and storage****7.1****Precautions for safe handling  
Handling**

Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.

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

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

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**SECTION 8: Exposure controls/personal protection****8.1****Control parameters**

PNEC	:	Fresh water Value: 0,0012 mg/l
PNEC	:	Sea water Value: 0,0012 mg/l
PNEC	:	Fresh water sediment Value: 2,14 mg/kg
PNEC	:	Sea sediment Value: 2,14 mg/kg
PNEC	:	Soil Value: 0,43 mg/kg

**8.2****Exposure controls****Personal protective equipment**

Hand protection	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Eye protection	:	Eye wash bottle with pure water. Tightly fitting safety goggles.
Skin and body protection	:	Impervious clothing. Choose body protection according to the amount and concentration of the dangerous substance at the work place.
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****9.1****Information on basic physical and chemical properties****Appearance**

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

**Safety data**

Flash point	:	49°C (120°F)
Lower explosion limit	:	0,7 %(V)
Upper explosion limit	:	5,9 %(V)

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Oxidizing properties	: no
Autoignition temperature	: 210°C (410°F)
Thermal decomposition	: No data available
Molecular formula	: C <sub>10</sub> H <sub>20</sub>
Molecular weight	: 140,3 g/mol
pH	: Not applicable
Freezing point	: -66°C (-87°F)
Pour point	No data available
Boiling point/boiling range	: 170,56°C (339,01°F)
Vapor pressure	: 0,21 kPa at 25°C (77°F)
	2,30 kPa at 65°C (149°F)
Relative density	: 0,75 at 15,6 °C (60,1 °F)
Density	: 745 kg/m <sup>3</sup> at 15°C (59°F)
	740 kg/m <sup>3</sup> at 20°C (68°F)
	717 kg/m <sup>3</sup> at 50°C (122°F)
Water solubility	: Soluble in hydrocarbon solvents; insoluble in water.
Partition coefficient: n-octanol/water	: No data available
Viscosity, kinematic	: 1,1 cSt at 20°C (68°F)
Relative vapor density	: 4,84 (Air = 1.0)
Evaporation rate	: No data available

**SECTION 10: Stability and reactivity****10.1**

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**Reactivity** : Stable at normal ambient temperature and pressure.

**10.2**

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

**10.3****Possibility of hazardous reactions**

**Hazardous reactions** : Hazardous reactions: Hazardous polymerization does not occur.

Further information: No decomposition if stored and applied as directed.

Hazardous reactions: Vapors may form explosive mixture with air.

**10.4**

**Conditions to avoid** : Heat, flames and sparks.

**10.5**

**Materials to avoid** : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

**Thermal decomposition** : No data available

**10.6**

**Hazardous decomposition products** : Carbon oxides

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

**SECTION 11: Toxicological information****11.1****Information on toxicological effects****Acute oral toxicity**

1-Decene : LD50: > 3.575 mg/kg  
Species: Rat  
Sex: male and female  
Method: Fixed Dose Method  
Information given is based on data obtained from similar substances.

**Acute inhalation toxicity**

1-Decene : LC50: > 2,1 mg/l  
Exposure time: 4 h  
Species: Rat  
Sex: male and female  
Method: OECD Test Guideline 403



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Information given is based on data obtained from similar substances.  
Not classified due to data which are conclusive although insufficient for classification.

**Acute dermal toxicity**

1-Decene : LD50: > 2.000 mg/kg  
Species: Rat  
Sex: male and female  
Method: OECD Test Guideline 402  
Information given is based on data obtained from similar substances.

**Skin irritation**

1-Decene : 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-Decene : No eye irritation

**Sensitization**

1-Decene : Did not cause sensitization on laboratory animals.  
Information given is based on data obtained from similar substances.

**Repeated dose toxicity**

1-Decene : Species: Rat, Male and female  
Sex: Male and female  
Application Route: Oral  
Dose: 0, 100, 500, 1000 mg/kg  
Exposure time: 13 wks  
Number of exposures: 7 d/wk  
NOEL: 1.000 mg/kg  
Method: OCED Guideline 408  
Information given is based on data obtained from similar substances.

Species: Rat, Male and female  
Sex: Male and female  
Application Route: Inhalation  
Dose: 0, 300, 1000, 3000 ppm  
Exposure time: 13 wks  
Number of exposures: 6 hr/d, 5 d/wk  
NOEL: 3000 ppm  
Method: OECD Guideline 413  
Information given is based on data obtained from similar substances.

**Genotoxicity in vitro**

1-Decene : Test Type: Ames test  
Metabolic activation: with and without metabolic activation  
Method: Mutagenicity (Escherichia coli - reverse mutation)

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assay)  
Result: negative

Test Type: Mammalian cell gene mutation assay  
Metabolic activation: with and without metabolic activation  
Method: OECD Guideline 476  
Result: negative

Test Type: Chromosome aberration test in vitro  
Metabolic activation: with and without metabolic activation  
Method: OECD Guideline 473  
Result: negative

**Genotoxicity in vivo**

1-Decene : Test Type: Micronucleus test  
Species: Mouse  
Method: Mutagenicity (micronucleus test)  
Result: negative

**Reproductive toxicity**

1-Decene : Species: Rat  
Sex: male  
Application Route: Oral diet  
Dose: 0, 100, 500, 1000 mg/kg  
Method: OECD Guideline 421  
NOAEL Parent: 1.000 mg/kg  
NOAEL F1: 1.000 mg/kg

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

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Further information**

: Solvents may degrease the skin.

**SECTION 12: Ecological information****12.1****Toxicity****Toxicity to fish**

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1-Decene : LC50: 0,12 mg/l  
 Exposure time: 96 h  
 Species: Oncorhynchus mykiss (rainbow trout)  
 semi-static test Method: OECD Test Guideline 203  
 Information given is based on data obtained from similar substances.

**Toxicity to daphnia and other aquatic invertebrates**

1-Decene : EC50: 0,56 - 1 mg/l  
 Exposure time: 48 h  
 Species: Daphnia  
 Method: OECD Test Guideline 202

**Toxicity to algae**

1-Decene : EC50: 1 - 1,8 mg/l  
 Exposure time: 72 h  
 Species: Pseudokirchneriella subcapitata (microalgae)  
 Method: OECD Test Guideline 201

**M-Factor**

dec-1-ene : M-Factor (Acute Aquat. Tox.) 1  
 M-Factor (Chron. Aquat. Tox.) 1

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**

1-Decene : NOEC: 0,0194 mg/l  
 Exposure time: 21 d  
 Species: Daphnia magna (Water flea)  
 Analytical monitoring: yes  
 Test substance: yes  
 Method: OECD Test Guideline 211

**12.2****Persistence and degradability**

Biodegradability : This material is expected to be readily biodegradable.

**12.3****Bioaccumulative potential**

Elimination information (persistence and degradability)

Bioaccumulation

1-Decene : No data available

**12.4****Mobility in soil**

Mobility

1-Decene : No data available

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**12.5****Results of PBT and vPvB assessment**

Results of PBT assessment

1-Decene : Non-classified PBT substance, Non-classified vPvB substance

**12.6****Other adverse effects**

Additional ecological information

: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Very toxic to aquatic life with long lasting effects.

**Ecotoxicology Assessment**

Short-term (acute) aquatic hazard

1-Decene : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard

1-Decene : Very toxic to aquatic life with long lasting effects.

**SECTION 13: Disposal considerations****13.1****Waste treatment methods**

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

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

Product : 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****14.1 - 14.7****Transport information**

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

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

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**US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)**

UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, III

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**

UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, III, (49°C), MARINE POLLUTANT, (1-DECENE)

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**

UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, III

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

UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, III, (D/E), ENVIRONMENTALLY HAZARDOUS, (1-DECENE)

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

UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, III, ENVIRONMENTALLY HAZARDOUS, (1-DECENE)

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

UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, III, ENVIRONMENTALLY HAZARDOUS, (1-DECENE)

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

<b>Other information</b>	<b>: Decene (N), S. T. 2, CAT. X</b>
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**SECTION 15: Regulatory information****15.1****Safety, health and environmental regulations/legislation specific for the substance or mixture**  
**National legislation**

Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

**Water contaminating class** : WGK 3 highly water endangering  
**(Germany)****15.2****Chemical Safety Assessment****Components** : dec-1-ene      A Chemical Safety Assessment      212-819-2  
has been carried out for this  
substance.

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**Major Accident Hazard Legislation**

: 96/82/EC Update: 2003  
Flammable.  
6  
Quantity 1: 5.000 t  
Quantity 2: 50.000 t

: 96/82/EC Update: 2003  
Dangerous for the environment  
9a  
Quantity 1: 100 t  
Quantity 2: 200 t

: 96/82/EC Update: 2003  
Flammable.  
6  
Quantity 1: 5.000 t  
Quantity 2: 50.000 t

**Notification status**

Europe REACH : This product is in full compliance according to REACH regulation 1907/2006/EC.

Switzerland CH INV : On the inventory, or in compliance with the inventory

United States of America (USA) TSCA : On or in compliance with the active portion of the TSCA inventory

Canada DSL : All components of this product are on the Canadian DSL

Australia AICS : On the inventory, or in compliance with the inventory

New Zealand NZIoC : On the inventory, or in compliance with the inventory

Japan ENCS : On the inventory, or in compliance with the inventory

Korea KECI : A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance.

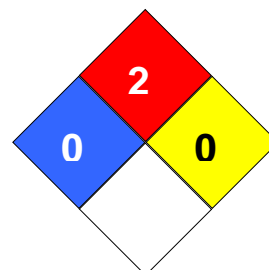
Philippines PICCS : On the inventory, or in compliance with the inventory

China IECSC : On the inventory, or in compliance with the inventory

Taiwan TCSI : On the inventory, or in compliance with the inventory

**SECTION 16: Other information**

**NFPA Classification** : Health Hazard: 0  
Fire Hazard: 2  
Reactivity Hazard: 0

**Further information**

Legacy SDS Number : PE0018

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

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

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

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

ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and 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 H-Statements referred to under sections 2 and 3.**

H226	Flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

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**Annex: Exposure Scenarios****Table of Contents**

Number	Title
ES 1	Manufacture; Industrial uses (SU3).
ES 2	Use as an intermediate; Industrial uses (SU3).
ES 3	Formulation; Industrial uses (SU3).
ES 4	Use in coatings – industrial; Industrial uses (SU3).
ES 5	Use in coatings – professional; Professional uses (SU22).
ES 6	Use in Coatings - Consumer; Consumer uses (SU21).
ES 7	Use in Oil and Gas field drilling and production operations - Industrial; Industrial uses (SU3).
ES 8	Use in polymer production – industrial; Industrial uses (SU3).

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**ES 1: Manufacture; Industrial uses (SU3).****1.1. Title section**

<b>Exposure Scenario name</b>	: Manufacture
<b>Structured Short Title</b>	: Manufacture; Industrial uses (SU3).
<b>Substance</b>	: dec-1-ene EC-No.: 212-819-2

**Environment**

<b>CS 1</b>	<b>Manufacture</b>	ERC1, ERC4
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**Worker**

<b>CS 2</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC1
<b>CS 3</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC2
<b>CS 4</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC3
<b>CS 5</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC4
<b>CS 6</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC8a
<b>CS 7</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC8b
<b>CS 8</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC15

**1.2. Conditions of use affecting exposure**

**1.2.1. Control of environmental exposure: Manufacture of the substance (ERC1) / Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)**

**Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

**Amount used (or contained in articles), frequency and duration of use/exposure**

Maximum allowable site tonnage (MSafe)	: 352.467 kg/day
Release type	: Continuous release
Emission days	: 300

**Technical and organisational conditions and measures**

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Risk from environmental exposure is driven by freshwater.

Air - minimum efficiency of 90 %

Water - minimum efficiency of 97,4 %

**Conditions and measures related to sewage treatment plant**

STP type	:	Municipal sewage treatment plant
STP sludge treatment	:	Prevent discharge of undissolved substance to or recover from wastewater. Do not apply industrial sludge to natural soils. Sewage sludge should be incinerated, contained or reclaimed.
STP effluent	:	2.000 m3/d

**Conditions and measures related to treatment of waste (including article waste)**

Waste treatment	:	External treatment and disposal of waste should comply with applicable local and/or national regulations.
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**Other conditions affecting environmental exposure**

Receiving surface water flow : 18.000 m3/d

Local freshwater dilution factor : 40

Local marine water dilution factor : 100

**1.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product	:	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure
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**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration	:	Covers daily exposures up to 8 hours
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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature	:	Assumes use at not more than 20°C above ambient temperature.
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**1.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**1.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient

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temperature.

**1.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**1.2.6. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

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Temperature : Assumes use at not more than 20°C above ambient temperature.

**1.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**1.2.8. Control of worker exposure: Use as laboratory reagent (PROC15)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

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Temperature : Assumes use at not more than 20°C above ambient temperature.

**1.3. Exposure estimation and reference to its source****1.3.1. Environmental release and exposure: Manufacture of the substance (ERC1) / Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)**

Protection Target	Exposure estimate	RCR
Freshwater	0,795 µg/l (EUSES)	0,662
Sea water	0,302 µg/l (EUSES)	0,252
Freshwater sediment	0,306 mg/kg wet weight (EUSES)	0,658
Sea sediment	0,116 mg/kg wet weight (EUSES)	0,250
Soil	0,0117 mg/kg wet weight (EUSES)	0,301
Air	0,0649 mg/m <sup>3</sup>	

**Additional information on exposure estimation**

Common practices vary across sites thus conservative process release estimates used.

**1.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**1.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**1.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**1.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

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**1.3.6. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**1.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**1.3.8. Worker exposure: Use as laboratory reagent (PROC15)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

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>).



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**ES 2: Use as an intermediate; Industrial uses (SU3).****2.1. Title section**

<b>Exposure Scenario name</b>	: Use as an intermediate
<b>Structured Short Title</b>	: Use as an intermediate; Industrial uses (SU3).
<b>Substance</b>	: dec-1-ene EC-No.: 212-819-2

**Environment**

<b>CS 1</b>	<b>Use as an intermediate</b>	ERC6a
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**Worker**

<b>CS 2</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC1
<b>CS 3</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC2
<b>CS 4</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC3
<b>CS 5</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC4
<b>CS 6</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC8a
<b>CS 7</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC8b
<b>CS 8</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC15

**2.2. Conditions of use affecting exposure****2.2.1. Control of environmental exposure: Use of intermediate (ERC6a)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

**Amount used (or contained in articles), frequency and duration of use/exposure**

Maximum allowable site tonnage (MSafe)	: 51.813 kg/day
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Release type	: Continuous release
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Emission days	: 300
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**Technical and organisational conditions and measures**

Risk from environmental exposure is driven by soil.

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Air - minimum efficiency of 80 %  
 Water - minimum efficiency of 97,4 %

**Conditions and measures related to sewage treatment plant**

STP type : Municipal sewage treatment plant  
 STP sludge treatment : Prevent discharge of undissolved substance to or recover from wastewater.  
 Do not apply industrial sludge to natural soils.  
 Sewage sludge should be incinerated, contained or reclaimed.  
 STP effluent : 2.000 m3/d

**Conditions and measures related to treatment of waste (including article waste)**

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

**Other conditions affecting environmental exposure**

Receiving surface water flow : 18.000 m3/d  
 Local freshwater dilution factor : 10  
 Local marine water dilution factor : 100

**2.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

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**2.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**2.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient

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temperature.

**2.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**2.2.6. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

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Temperature : Assumes use at not more than 20°C above ambient temperature.

**2.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**2.2.8. Control of worker exposure: Use as laboratory reagent (PROC15)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

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Temperature : Assumes use at not more than 20°C above ambient temperature.

**2.3. Exposure estimation and reference to its source****2.3.1. Environmental release and exposure: Use of intermediate (ERC6a)**

Protection Target	Exposure estimate	RCR
Freshwater	0,433 µg/l (EUSES)	0,361
Sea water	0,0426 µg/l (EUSES)	0,036
Freshwater sediment	0,167 mg/kg wet weight (EUSES)	0,359
Sea sediment	0,0164 mg/kg wet weight (EUSES)	0,035
Soil	0,220 mg/kg wet weight (EUSES)	0,579
Air	0,0017 mg/m <sup>3</sup>	

**Additional information on exposure estimation**

Common practices vary across sites thus conservative process release estimates used.

**2.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**2.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**2.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**2.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

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**2.3.6. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**2.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**2.3.8. Worker exposure: Use as laboratory reagent (PROC15)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

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>).

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**ES 3: Formulation; Industrial uses (SU3).****3.1. Title section**

<b>Exposure Scenario name</b>	: Formulation
<b>Structured Short Title</b>	: Formulation; Industrial uses (SU3).
<b>Substance</b>	: dec-1-ene EC-No.: 212-819-2

**Environment**

<b>CS 1</b>	<b>Formulation</b>	<b>ERC2</b>
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**Worker**

<b>CS 2</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC1</b>
<b>CS 3</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC2</b>
<b>CS 4</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC3</b>
<b>CS 5</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC4</b>
<b>CS 6</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC8a</b>
<b>CS 7</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC8b</b>
<b>CS 8</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC9</b>
<b>CS 9</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC14</b>
<b>CS 10</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC15</b>

**3.2. Conditions of use affecting exposure****3.2.1. Control of environmental exposure: Formulation into mixture (ERC2)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

**Amount used (or contained in articles), frequency and duration of use/exposure**

<b>Maximum allowable site tonnage (MSafe)</b>	: 91.503 kg/day
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<b>Release type</b>	: Continuous release
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Emission days : 300

**Technical and organisational conditions and measures**

Risk from environmental exposure is driven by soil.

Air - minimum efficiency of 0 %

Water - minimum efficiency of 97,4 %

**Conditions and measures related to sewage treatment plant**

STP type : Municipal sewage treatment plant

STP sludge treatment : Prevent discharge of undissolved substance to or recover from wastewater.  
Do not apply industrial sludge to natural soils.  
Sewage sludge should be incinerated, contained or reclaimed.

STP effluent : 2.000 m3/d

**Conditions and measures related to treatment of waste (including article waste)**

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

**Other conditions affecting environmental exposure**

Receiving surface water flow : 18.000 m3/d

Local freshwater dilution factor : 10

Local marine water dilution factor : 100

**3.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient

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**3.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**3.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

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**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**3.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**3.2.6. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

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**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**3.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**3.2.8. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

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**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**3.2.9. Control of worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**3.2.10. Control of worker exposure: Use as laboratory reagent (PROC15)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

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**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**3.3. Exposure estimation and reference to its source****3.3.1. Environmental release and exposure: Formulation into mixture (ERC2)**

Protection Target	Exposure estimate	RCR
Freshwater	0,0005 mg/l (EUSES)	0,414
Sea water	0,049 µg/l (EUSES)	0,041
Freshwater sediment	0,191 mg/kg wet weight (EUSES)	0,412
Sea sediment	0,019 mg/kg wet weight (EUSES)	0,041
Soil	0,290 mg/kg wet weight (EUSES)	0,765
Air	0,195 mg/m <sup>3</sup>	

**Additional information on exposure estimation**

Common practices vary across sites thus conservative process release estimates used.

**3.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**3.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**3.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**3.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

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**3.3.6. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**3.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**3.3.8. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**3.3.9. Worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**3.3.10. Worker exposure: Use as laboratory reagent (PROC15)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

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>).

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**ES 4: Use in coatings – industrial; Industrial uses (SU3).****4.1. Title section**

<b>Exposure Scenario name</b>	: Use in coatings – industrial
<b>Structured Short Title</b>	: Use in coatings – industrial; Industrial uses (SU3).
<b>Substance</b>	: dec-1-ene EC-No.: 212-819-2

**Environment**

<b>CS 1</b>	<b>Use in coatings – industrial</b>	<b>ERC4</b>
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**Worker**

<b>CS 2</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC1</b>
<b>CS 3</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC2</b>
<b>CS 4</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC3</b>
<b>CS 5</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC4</b>
<b>CS 6</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC5</b>
<b>CS 7</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC7</b>
<b>CS 8</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC8a</b>
<b>CS 9</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC8b</b>
<b>CS 10</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC9</b>
<b>CS 11</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC10</b>
<b>CS 12</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC13</b>
<b>CS 13</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC14</b>
<b>CS 14</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC15</b>

**4.2. Conditions of use affecting exposure**

**4.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)**



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**Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

**Amount used (or contained in articles), frequency and duration of use/exposure**Maximum allowable site tonnage : 19.491 kg/day  
(MSafe)

Release type : Continuous release

Emission days : 300

**Technical and organisational conditions and measures**

Risk from environmental exposure is driven by soil.

Air - minimum efficiency of 90 %

Water - minimum efficiency of 97,4 %

**Conditions and measures related to sewage treatment plant**

STP type : Municipal sewage treatment plant

STP sludge treatment : Prevent discharge of undissolved substance to or recover from wastewater.  
Do not apply industrial sludge to natural soils.  
Sewage sludge should be incinerated, contained or reclaimed.

STP effluent : 2.000 m3/d

**Conditions and measures related to treatment of waste (including article waste)**

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

**Other conditions affecting environmental exposure**

Receiving surface water flow : 18.000 m3/d

Local freshwater dilution factor : 10

Local marine water dilution factor : 100

**4.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and measures**

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

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.7. Control of worker exposure: Industrial spraying (PROC7)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.9. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.10. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.11. Control of worker exposure: Roller application or brushing (PROC10)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.12. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.13. Control of worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.2.14. Control of worker exposure: Use as laboratory reagent (PROC15)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**4.3. Exposure estimation and reference to its source****4.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)**

Protection Target	Exposure estimate	RCR
Freshwater	0,334 µg/l (EUSES)	0,278
Sea water	0,0326 µg/l (EUSES)	0,027
Freshwater sediment	0,129 mg/kg wet weight (EUSES)	0,276
Sea sediment	0,0126 mg/kg wet weight (EUSES)	0,027
Soil	0,216 mg/kg wet weight (EUSES)	0,570
Air	0,303 mg/m <sup>3</sup>	

**Additional information on exposure estimation**

Common practices vary across sites thus conservative process release estimates used.

**4.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.



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**4.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)**

**Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)**

**Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.3.6. Worker exposure: Mixing or blending in batch processes (PROC5)**

**Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.3.7. Worker exposure: Industrial spraying (PROC7)**

**Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)**

**Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.3.9. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)**

**Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.3.10. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)**

**Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.3.11. Worker exposure: Roller application or brushing (PROC10)**

**Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

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**4.3.12. Worker exposure: Treatment of articles by dipping and pouring (PROC13)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.3.13. Worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.3.14. Worker exposure: Use as laboratory reagent (PROC15)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

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>).

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**ES 5: Use in coatings – professional; Professional uses (SU22).****5.1. Title section**

<b>Exposure Scenario name</b>	: Use in coatings – professional
<b>Structured Short Title</b>	: Use in coatings – professional; Professional uses (SU22).
<b>Substance</b>	: dec-1-ene EC-No.: 212-819-2

**Environment**

<b>CS 1</b>	<b>Use in coatings – professional</b>	ERC8a, ERC8d
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**Worker**

<b>CS 2</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC1
<b>CS 3</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC2
<b>CS 4</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC3
<b>CS 5</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC4
<b>CS 6</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC5
<b>CS 7</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC8a
<b>CS 8</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC8b
<b>CS 9</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC10
<b>CS 10</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC11
<b>CS 11</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC13
<b>CS 12</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC15
<b>CS 13</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC19

**5.2. Conditions of use affecting exposure**

**5.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)**

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**Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

**Amount used (or contained in articles), frequency and duration of use/exposure**

Maximum allowable site tonnage (MSafe) : 52 kg/day

Release type : Wide dispersive use

Emission days : 300

**Technical and organisational conditions and measures**

Risk from environmental exposure is driven by soil.

Air - minimum efficiency of 0 %

Water - minimum efficiency of 97,4 %

**Conditions and measures related to sewage treatment plant**

STP type : Municipal sewage treatment plant

STP sludge treatment : Prevent discharge of undissolved substance to or recover from wastewater.  
Do not apply industrial sludge to natural soils.  
Sewage sludge should be incinerated, contained or reclaimed.

STP effluent : 2.000 m3/d

**Conditions and measures related to treatment of waste (including article waste)**

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

**Other conditions affecting environmental exposure**

Receiving surface water flow : 18.000 m3/d

Local freshwater dilution factor : 10

Local marine water dilution factor : 100

**5.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and measures**

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

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.9. Control of worker exposure: Roller application or brushing (PROC10)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.10. Control of worker exposure: Non-industrial spraying (PROC11)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours



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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.11. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.12. Control of worker exposure: Use as laboratory reagent (PROC15)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.2.13. Control of worker exposure: Manual activities involving hand contact (PROC19)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**5.3. Exposure estimation and reference to its source****5.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)**

Protection Target	Exposure estimate	RCR
Freshwater	0,334 µg/l (EUSES)	0,278
Sea water	0,0326 µg/l (EUSES)	0,027
Freshwater sediment	0,129 mg/kg wet weight (EUSES)	0,276

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Sea sediment	0,0126 mg/kg wet weight (EUSES)	0,027
Soil	0,163 mg/kg wet weight (EUSES)	0,431
Air	0,0061 mg/m <sup>3</sup>	

**Additional information on exposure estimation**

Common practices vary across sites thus conservative process release estimates used.

**5.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.3.6. Worker exposure: Mixing or blending in batch processes (PROC5)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

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**5.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.3.9. Worker exposure: Roller application or brushing (PROC10)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.3.10. Worker exposure: Non-industrial spraying (PROC11)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.3.11. Worker exposure: Treatment of articles by dipping and pouring (PROC13)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.3.12. Worker exposure: Use as laboratory reagent (PROC15)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.3.13. Worker exposure: Manual activities involving hand contact (PROC19)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**5.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

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>).

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**ES 6: Use in Coatings - Consumer; Consumer uses (SU21).****6.1. Title section**

<b>Exposure Scenario name</b>	: Use in Coatings - Consumer
<b>Structured Short Title</b>	: Use in Coatings - Consumer; Consumer uses (SU21).
<b>Substance</b>	: dec-1-ene EC-No.: 212-819-2

**Environment**

<b>CS 1</b>	<b>Use in Coatings - Consumer</b>	ERC8a, ERC8d
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**Consumer**

<b>CS 2</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC1
<b>CS 3</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC4
<b>CS 4</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC8
<b>CS 5</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC9a
<b>CS 6</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC9b
<b>CS 7</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC9c
<b>CS 8</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC15
<b>CS 9</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC18
<b>CS 10</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC23
<b>CS 11</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC24
<b>CS 12</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC31
<b>CS 13</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PC34

**6.2. Conditions of use affecting exposure**

**6.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)**

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**Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

**Amount used (or contained in articles), frequency and duration of use/exposure**

Maximum allowable site tonnage (MSafe) : 52 kg/day

Release type : Wide dispersive use

Emission days : 365

**Conditions and measures related to treatment of waste (including article waste)**

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

**Other conditions affecting environmental exposure**

Receiving surface water flow : 18.000 m3/d

Local freshwater dilution factor : 10

Local marine water dilution factor : 100

**6.2.2. Control of consumer exposure: Adhesives, sealants (PC1)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.3. Control of consumer exposure: Anti-Freeze and de-icing products (PC4)****Product (article) characteristics**

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Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.4. Control of consumer exposure: Biocidal products (PC8)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.5. Control of consumer exposure: Coatings and paints, thinners, paint removers (PC9a)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

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Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.6. Control of consumer exposure: Fillers, putties, plasters, modelling clay (PC9b)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.7. Control of consumer exposure: Finger paints (PC9c)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure



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**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.8. Control of consumer exposure: Non-metal surface treatment products (PC15)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.9. Control of consumer exposure: Ink and toners (PC18)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

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Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.10. Control of consumer exposure: Leather treatment products (PC23)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.11. Control of consumer exposure: Lubricants, greases, release products (PC24)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

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**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.12. Control of consumer exposure: Polishes and wax blends (PC31)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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.

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.2.13. Control of consumer exposure: Textile dyes and impregnating products (PC34)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Conditions and measures related to personal protection, hygiene and health evaluation**

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

**Other conditions affecting consumers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**6.3. Exposure estimation and reference to its source**

**6.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a) / Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d)**

Protection Target	Exposure estimate	RCR
Freshwater	0,283 µg/l (EUSES)	0,236
Sea water	0,0276 µg/l (EUSES)	0,023
Freshwater sediment	0,109 mg/kg wet weight (EUSES)	0,235
Sea sediment	0,0106 mg/kg wet weight (EUSES)	0,023
Soil	0,135 mg/kg wet weight (EUSES)	0,355
Air	0,005 mg/m <sup>3</sup>	

**Additional information on exposure estimation**

Common practices vary across sites thus conservative process release estimates used.

**6.3.2. Consumer exposure: Adhesives, sealants (PC1)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**6.3.3. Consumer exposure: Anti-Freeze and de-icing products (PC4)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**6.3.4. Consumer exposure: Biocidal products (PC8)****Additional information on exposure estimation**

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A quantitative risk assessment is not required for human health.

**6.3.5. Consumer exposure: Coatings and paints, thinners, paint removers (PC9a)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**6.3.6. Consumer exposure: Fillers, putties, plasters, modelling clay (PC9b)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**6.3.7. Consumer exposure: Finger paints (PC9c)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**6.3.8. Consumer exposure: Non-metal surface treatment products (PC15)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**6.3.9. Consumer exposure: Ink and toners (PC18)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**6.3.10. Consumer exposure: Leather treatment products (PC23)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**6.3.11. Consumer exposure: Lubricants, greases, release products (PC24)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

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**6.3.12. Consumer exposure: Polishes and wax blends (PC31)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**6.3.13. Consumer exposure: Textile dyes and impregnating products (PC34)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

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>).

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**ES 7: Use in Oil and Gas field drilling and production operations - Industrial; Industrial uses (SU3).****7.1. Title section**

<b>Exposure Scenario name</b>	: Use in Oil and Gas field drilling and production operations - Industrial
<b>Structured Short Title</b>	: Use in Oil and Gas field drilling and production operations - Industrial; Industrial uses (SU3).
<b>Substance</b>	: dec-1-ene EC-No.: 212-819-2

**Environment**

<b>CS 1</b>	<b>Use in Oil and Gas field drilling and production operations - Industrial</b>	<b>ERC4</b>
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**Worker**

<b>CS 2</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC1</b>
<b>CS 3</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC2</b>
<b>CS 4</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC3</b>
<b>CS 5</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC4</b>
<b>CS 6</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC8a</b>
<b>CS 7</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	<b>PROC8b</b>

**7.2. Conditions of use affecting exposure****7.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

**Amount used (or contained in articles), frequency and duration of use/exposure**

Release type : Continuous release

Remarks : Not applicable

**Technical and organisational conditions and measures**

Discharge to aquatic environment is restricted (see section 4.2).

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**Conditions and measures related to sewage treatment plant**

STP type	:	Municipal sewage treatment plant
STP sludge treatment	:	Prevent environmental discharge consistent with regulatory requirements.

**Conditions and measures related to treatment of waste (including article waste)**

Waste treatment	:	External treatment and disposal of waste should comply with applicable local and/or national regulations.
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**7.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product	:	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure
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**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration	:	Covers daily exposures up to 8 hours
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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature	:	Assumes use at not more than 20°C above ambient temperature.
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**7.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product	:	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure
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**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration	:	Covers daily exposures up to 8 hours
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**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**7.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**7.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

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Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**7.2.6. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**7.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure &lt; 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

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Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**7.3. Exposure estimation and reference to its source****7.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)****Additional information on exposure estimation**

There are no expected releases to the environment from this use, so no exposure assessment is made.

**7.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**7.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**7.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**7.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

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**7.3.6. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**7.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**7.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

Discharge to aquatic environment is restricted by law and industry prohibits release.

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**ES 8: Use in polymer production – industrial; Industrial uses (SU3).****8.1. Title section**

<b>Exposure Scenario name</b>	: Use in polymer production – industrial
<b>Structured Short Title</b>	: Use in polymer production – industrial; Industrial uses (SU3).
<b>Substance</b>	: dec-1-ene EC-No.: 212-819-2

**Environment**

<b>CS 1</b>	<b>Use in polymer production – industrial</b>	ERC4, ERC6c
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**Worker**

<b>CS 2</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC1
<b>CS 3</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC2
<b>CS 4</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC3
<b>CS 5</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC4
<b>CS 6</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC5
<b>CS 7</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC6
<b>CS 8</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC8a
<b>CS 9</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC8b
<b>CS 10</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC14
<b>CS 11</b>	<b>General measures applicable to all activities, General measures (skin irritants)</b>	PROC21

**8.2. Conditions of use affecting exposure**

**8.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4) / Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6c)**

**Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

**Amount used (or contained in articles), frequency and duration of use/exposure**

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Maximum allowable site tonnage : 51.203 kg/day  
(MSafe)

Release type : Continuous release

Emission days : 300

**Technical and organisational conditions and measures**

Risk from environmental exposure is driven by soil.

Air - minimum efficiency of 80 %

Water - minimum efficiency of 97,4 %

**Conditions and measures related to sewage treatment plant**

STP type : Municipal sewage treatment plant

STP sludge treatment : Prevent discharge of undissolved substance to or recover from wastewater.  
Do not apply industrial sludge to natural soils.  
Sewage sludge should be incinerated, contained or reclaimed.

STP effluent : 2.000 m3/d

**Conditions and measures related to treatment of waste (including article waste)**

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

**Other conditions affecting environmental exposure**

Receiving surface water flow : 18.000 m3/d

Local freshwater dilution factor : 10

Local marine water dilution factor : 100

**8.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

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**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**8.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**8.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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 /

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minimise exposures and to report any skin problems that may develop.  
No other specific measures identified.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**8.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**8.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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 /



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minimise exposures and to report any skin problems that may develop.  
No other specific measures identified.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**8.2.7. Control of worker exposure: Calendering operations (PROC6)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**8.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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 /

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minimise exposures and to report any skin problems that may develop.  
No other specific measures identified.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**8.2.9. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**8.2.10. Control of worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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

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occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.  
No other specific measures identified.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**8.2.11. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)****Product (article) characteristics**

Covers percentage substance in the product up to 100 %.

Physical form of product : Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

**Amount used (or contained in articles), frequency and duration of use/exposure**

Duration : Covers daily exposures up to 8 hours

**Technical and organisational conditions and 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.

**Other conditions affecting workers exposure**

Temperature : Assumes use at not more than 20°C above ambient temperature.

**8.3. Exposure estimation and reference to its source****8.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4) / Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6c)**

Protection Target	Exposure estimate	RCR
Freshwater	0,476 µg/l (EUSES)	0,396
Sea water	0,0468 µg/l (EUSES)	0,039
Freshwater sediment	0,183 mg/kg wet weight (EUSES)	0,394
Sea sediment	0,018 mg/kg wet weight (EUSES)	0,039
Soil	0,247 mg/kg wet weight (EUSES)	0,651
Air	0,0185 mg/m <sup>3</sup>	

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**Additional information on exposure estimation**

Common practices vary across sites thus conservative process release estimates used.

**8.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**8.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**8.3.4. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**8.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**8.3.6. Worker exposure: Mixing or blending in batch processes (PROC5)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**8.3.7. Worker exposure: Calendering operations (PROC6)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**8.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

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**8.3.9. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**8.3.10. Worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**8.3.11. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)****Additional information on exposure estimation**

A quantitative risk assessment is not required for human health.

**8.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

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>).