



1-Decene

Version 3.15

Revision Date 2023-01-25

According to Regulation (EC) No. 1907/2006, Regulation (EC) No. 2020/878

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

1.1 Product identifier

Product information

Product Name : 1-Decene
Material : 1077811

EC-No.Registration number

Chemical name	CAS-No. EC-No. Index No.	Legal Entity Registration number
1-Decene	872-05-9 212-819-2	Qatar Chemical Company LTD (Q-Chem) 01-2119486878-12-0005

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 : Qatar Chemical Company LTD (QChem)
 Amwal Tower, Omar Al Mukhtar St,
 Al-Dafna (Zone 61)
 PO Box 24646
 Doha, Qatar

SDS Requests: (+974) 4484-7110
 Technical Information: (+974) 4476-7145
 Responsible Party: Product Safety Group
 Email: MSDSInquiry@qchem.com.qa

Local : Muntajat B.V. (MBV OR)
 19th Floor, Tower E, WTC The Hague
 Prinses Margrietplantsoen 78-A, 2595 BR
 The Hague, the Netherlands.
 Tel: +31702055630
 Email: info.netherlands@muntajatbv.com

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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

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

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

Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)

Belgium: 070 245 245 (24 hours/day, 7 days/week)

Bulgaria: +359 2 9154 233

Croatia: +3851 2348 342 (24 hours/day, 7 days/week)

Cyprus: 1401

Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402

Denmark: Danish Poison Center (Gifflinjen): +45 8212 1212

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

Finland: 0800 147 111 09 471 977 (24 hours/day)

France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)

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

Greece: (0030) 2107793777 (24 hours/day, 7 days/week)

Hungary: +36-80-201-199 (24 hours/day, 7 days/week)

Iceland: 543 2222 (24 hours/day, 7 days/week)

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

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

Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic

Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)

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

Lithuania: +370 (85) 2362052

Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)

Malta: +356 2395 2000

The Netherlands: NVIC: +31 (0)88 755 8000

Norway: 22 59 13 00 (24 hours/day, 7 days/week)

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

Portugal: CIAV phone number: +351 800 250 250

Romania: +40213183606

Slovakia: +421 2 5477 4166

Slovenia: Phone number: 112

Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24 hours/day, 7 days/week)

Sweden: 112 – ask for Poisons Information

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

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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.

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

2.3**Other hazards**Results of PBT and vPvB
assessment

: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

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

SDS Number:100000068090

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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%]	Specific Conc. Limits, M-factors and ATEs
1-Decene	872-05-9 212-819-2	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	96 - 100	M [Acute]=1 M [Chronic]=1
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.

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.

4.2 Most important symptoms and effects, both acute and delayed**Notes to physician**

Symptoms : No data available.

Risks : No data available.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : No data available.

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SECTION 5: Firefighting measures

Flash point : 49°C (120°F)
Method: closed cup

Autoignition temperature : 210°C (410°F)

5.1**Extinguishing media**

Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO₂). 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 a naked flame or any 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**

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.

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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 a naked flame or any 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.

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

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	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) Method: closed cup
Lower explosion limit	: 0,7 %(V)
Upper explosion limit	: 5,9 %(V)
Oxidizing properties	: no
Autoignition temperature	: 210°C (410°F)
Thermal decomposition	: No data available
Molecular formula	: C ₁₀ H ₂₀
Molecular weight	: 140,3 g/mol

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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 ³ at 15°C (59°F)
	740 kg/m ³ at 20°C (68°F)
	717 kg/m ³ 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**

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

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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
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.

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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 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

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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.

11.2**Information on other hazards****1-Decene****Further information**
Endocrine disrupting properties

: Solvents may degrease the skin.
 : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

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

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.

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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

12.5**Results of PBT and vPvB assessment**

Results of PBT assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

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12.6**Endocrine disrupting properties**

Endocrine disrupting properties : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7**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.

12.8**Additional Information****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**

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

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

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

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

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, III, (49 °C c.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))

30, 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)

For Tank Vessels and/or Barges:

UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, (N1, CMR, F), III, ENVIRONMENTALLY HAZARDOUS, (1-Decene)

Other information	:	Decene, S.T.2, Cat. X
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Maritime transport in bulk according to IMO instruments

SECTION 15: Regulatory information**15.1**

Safety, health and environmental regulations/legislation specific for the substance or mixture
National legislation

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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 hazard class (Germany) : WGK 3 highly water endangering

15.2**Chemical Safety Assessment**

Components : dec-1-ene A Chemical Safety Assessment 212-819-2 has been carried out for this substance.

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

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

Other 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 or the exported amount does not exceed the minimum threshold quantity of the non-registered substance(s).

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

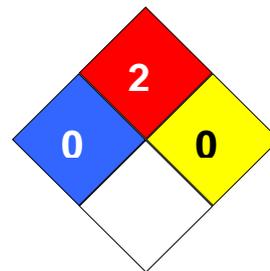
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SECTION 16: Other information

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

**Further information**

Legacy SDS Number : QCHEM011

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

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

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
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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).
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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**

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

Environment

CS 1	Manufacture	ERC1, ERC4
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Worker

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

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

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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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 < 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 < 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 < 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 < 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 ³	

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**

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

Environment

CS 1	Use as an intermediate	ERC6a
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Worker

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

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**

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

Environment

CS 1	Formulation	ERC2
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Worker

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

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

Maximum allowable site tonnage (MSafe)	: 91.503 kg/day
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Release type	: 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 < 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.

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 < 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 < 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 ³	

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**

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

Environment

CS 1	Use in coatings – industrial	ERC4
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Worker

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

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/exposureMaximum 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 < 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 ³	

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**

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

Environment

CS 1	Use in coatings – professional	ERC8a, ERC8d
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Worker

CS 2	General measures applicable to all activities, General measures (skin irritants)	PROC1
CS 3	General measures applicable to all activities, General measures (skin irritants)	PROC2
CS 4	General measures applicable to all activities, General measures (skin irritants)	PROC3
CS 5	General measures applicable to all activities, General measures (skin irritants)	PROC4
CS 6	General measures applicable to all activities, General measures (skin irritants)	PROC5
CS 7	General measures applicable to all activities, General measures (skin irritants)	PROC8a
CS 8	General measures applicable to all activities, General measures (skin irritants)	PROC8b
CS 9	General measures applicable to all activities, General measures (skin irritants)	PROC10
CS 10	General measures applicable to all activities, General measures (skin irritants)	PROC11
CS 11	General measures applicable to all activities, General measures (skin irritants)	PROC13
CS 12	General measures applicable to all activities, General measures (skin irritants)	PROC15
CS 13	General measures applicable to all activities, General measures (skin irritants)	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/exposureMaximum allowable site tonnage : 52 kg/day
(MSafe)

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 < 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 ³	

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**

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

Environment

CS 1	Use in Coatings - Consumer	ERC8a, ERC8d
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Consumer

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

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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.

6.2.8. 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 < 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 < 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.

6.2.10. 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 < 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 < 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.

6.2.12. 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

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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.

6.3. 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 ³	

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.

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

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)

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Additional information on exposure estimation

A quantitative risk assessment is not required for human health.

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**

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

Environment

CS 1	Use in Oil and Gas field drilling and production operations - Industrial	ERC4
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Worker

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

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.

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

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.

7.2.3. 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

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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 < 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 < 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**

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

Environment

CS 1	Use in polymer production – industrial	ERC4, ERC6c
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Worker

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

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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>).