



SAFETY DATA SHEET LEMON OIL

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

1.1. Product identifier

Product name	LEMON OIL
Product number	55945
Synonyms; trade names	LEMON OIL ORGANIC IT
REACH registration number	01-2119495512-35-XXXX
CAS number	8008-56-8
EC number	284-515-8
FEMA	2625

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

Identified uses	Cosmetics
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1.3. Details of the supplier of the safety data sheet

Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com
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1.4. Emergency telephone number

Emergency telephone	SGS - +32 (0)3 575 55 55 (24h)
Sds No.	55945

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

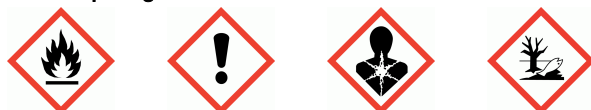
Classification (EC 1272/2008)

Physical hazards	Flam. Liq. 3 - H226
Health hazards	Skin Irrit. 2 - H315 Skin Sens. 1 - H317 Asp. Tox. 1 - H304
Environmental hazards	Aquatic Chronic 2 - H411

2.2. Label elements

EC number	284-515-8
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Hazard pictograms



LEMON OIL

Signal word	Danger
Hazard statements	H226 Flammable liquid and vapour. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H304 May be fatal if swallowed and enters airways. H411 Toxic to aquatic life with long lasting effects.
Precautionary statements	P202 Do not handle until all safety precautions have been read and understood. P261 Avoid breathing vapour/ spray. P273 Avoid release to the environment. P302+P352 IF ON SKIN: Wash with plenty of water. P501 Dispose of contents/ container in accordance with national regulations.
Contains	LIMONENE, PIN-2-(10) ENE, P-MENTHA-1,4-DIENE, 2-PINENE, MYRCENE, (E)-3,7-DIMETHYLOCTA-2,6-DIENAL, (Z)-3,7-DIMETHYLOCTA-2,6-DIENAL, (4S)-1-METHYL-4-(6-METHYLHEPTA-1,5-DIEN-2-YL)CYCLOHEX-1-ENE, 5-ISOPROPYL-2-METHYLBICYCLO[3.1.0]HEX-2-ENE, GERANYL ACETATE, p-MENTHA-1,4(8)-DIENE, CARYOPHYLLENE, LINALOOL

2.3. Other hazards

This product does not contain any substances classified as PBT or vPvB.

SECTION 3: Composition/information on ingredients

3.1. Substances

LIMONENE		60-100%
CAS number: 138-86-3	EC number: 205-341-0	
M factor (Acute) = 1	M factor (Chronic) = 1	
Classification Flam. Liq. 3 - H226 Skin Irrit. 2 - H315 Skin Sens. 1 - H317 Aquatic Acute 1 - H400 Aquatic Chronic 1 - H410		
PIN-2-(10) ENE		10-30%
CAS number: 127-91-3	EC number: 204-872-5	
M factor (Acute) = 1	M factor (Chronic) = 1	
Classification Flam. Liq. 3 - H226 Skin Irrit. 2 - H315 Skin Sens. 1B - H317 Asp. Tox. 1 - H304 Aquatic Acute 1 - H400 Aquatic Chronic 1 - H410		

LEMON OIL

P-MENTHA-1,4-DIENE		5-10%
CAS number: 99-85-4	EC number: 202-794-6	
Classification Flam. Liq. 3 - H226 Repr. 2 - H361d Asp. Tox. 1 - H304		
2-PINENE		1-5%
CAS number: 80-56-8	EC number: 201-291-9	
M factor (Acute) = 1	M factor (Chronic) = 1	
Classification Flam. Liq. 3 - H226 Acute Tox. 4 - H302 Skin Irrit. 2 - H315 Skin Sens. 1 - H317 Asp. Tox. 1 - H304 Aquatic Acute 1 - H400 Aquatic Chronic 1 - H410		
MYRCENE		1-5%
CAS number: 123-35-3	EC number: 204-622-5	
Classification Flam. Liq. 3 - H226 Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 Asp. Tox. 1 - H304		
(E)-3,7-DIMETHYLOCTA-2,6-DIENAL		1-5%
CAS number: 141-27-5	EC number: 205-476-5	
Classification Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 Skin Sens. 1B - H317		
(Z)-3,7-DIMETHYLOCTA-2,6-DIENAL		<1%
CAS number: 106-26-3	EC number: 203-379-2	
Classification Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 Skin Sens. 1B - H317		

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(4S)-1-METHYL-4-(6-METHYLHEPTA-1,5-DIEN-2-YL)CYCLOHEX-1-ENE

<1%

CAS number: 495-61-4

EC number: 610-461-5

Classification

Skin Irrit. 2 - H315

Skin Sens. 1 - H317

Asp. Tox. 1 - H304

5-ISOPROPYL-2-METHYLBICYCLO[3.1.0]HEX-2-ENE

<1%

CAS number: 2867-05-2

EC number: 220-686-7

Classification

Flam. Liq. 3 - H226

Skin Sens. 1 - H317

GERANYL ACETATE

<1%

CAS number: 105-87-3

EC number: 203-341-5

REACH registration number: 01-2119973480-35-XXXX

Classification

Skin Irrit. 2 - H315

Skin Sens. 1 - H317

Aquatic Chronic 3 - H412

p-MENTHA-1,4(8)-DIENE

<1%

CAS number: 586-62-9

EC number: 209-578-0

REACH registration number: 01-2119982324-34-XXXX

M factor (Acute) = 1

M factor (Chronic) = 1

Classification

Flam. Liq. 3 - H226

Skin Sens. 1B - H317

Asp. Tox. 1 - H304

Aquatic Acute 1 - H400

Aquatic Chronic 1 - H410

PARA CYMENE

<1%

CAS number: 99-87-6

EC number: 202-796-7

Classification

Flam. Liq. 3 - H226

Acute Tox. 3 - H331

Repr. 2 - H361

Asp. Tox. 1 - H304

Aquatic Chronic 2 - H411

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CARYOPHYLLENE			<1%
CAS number: 87-44-5	EC number: 201-746-1	REACH registration number: 01-2120745237-53-XXXX	

Classification

Skin Sens. 1 - H317
 Asp. Tox. 1 - H304
 Aquatic Chronic 4 - H413

LINALOOL			<1%
CAS number: 78-70-6	EC number: 201-134-4	REACH registration number: 01-2119474016-42-XXXX	

Acute Toxicity Estimate (oral):
 LD₅₀ 2790 mg/kg, Oral, Rat
 Acute Toxicity Estimate (dermal):
 LD₅₀ 5610 mg/kg, Dermal, Rabbit

Classification

Skin Irrit. 2 - H315
 Eye Irrit. 2 - H319
 Skin Sens. 1B - H317

The full text for all hazard statements is displayed in Section 16.

Product name	LEMON OIL
REACH registration number	01-2119495512-35-XXXX
CAS number	8008-56-8
EC number	284-515-8
Composition comments	The data shown are in accordance with the latest EC Directives.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Get medical attention if symptoms are severe or persist.
Ingestion	Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Rinse mouth thoroughly with water. Give a few small glasses of water or milk to drink. Get medical attention if symptoms are severe or persist.
Skin contact	Take off immediately all contaminated clothing. Wash skin thoroughly with soap and water. Continue to rinse. Get medical attention if symptoms are severe or persist.
Eye contact	Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention if symptoms are severe or persist.

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

Ingestion	May be fatal if swallowed and enters airways.
Skin contact	Causes skin irritation. May cause an allergic skin reaction.

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

LEMON OIL

Notes for the doctor Treat symptomatically. Contact specialist immediately poison treatment if large quantities have been ingested or inhaled

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours.

5.3. Advice for firefighters

Protective actions during firefighting Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk.

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Follow precautions for safe handling described in this safety data sheet. Avoid inhalation of vapours and contact with skin and eyes. Provide adequate ventilation.

6.2. Environmental precautions

Environmental precautions Avoid the spillage or runoff entering drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Absorb spillage with inert, damp, non-combustible material. Flush contaminated area with plenty of water. Collect and place in suitable waste disposal containers and seal securely. Provide adequate ventilation.

6.4. Reference to other sections

Reference to other sections Wear protective clothing as described in Section 8 of this safety data sheet. Collect and dispose of spillage as indicated in Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Wear protective clothing as described in Section 8 of this safety data sheet. Avoid inhalation of vapours and contact with skin and eyes. In case of insufficient ventilation, wear suitable respiratory equipment. Provide adequate ventilation.

Advice on general occupational hygiene Do not eat, drink or smoke when using this product. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Avoid exposure to high temperatures or direct sunlight.

Storage class Flammable liquid storage.

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7.3. Specific end use(s)

Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

LIMONENE (CAS: 138-86-3)

Ingredient comments	No exposure limits known for ingredient(s).
DNEL	Workers - Dermal; Short term : 222 µg/cm ² Workers - Inhalation; Long term : 33.3 mg/m ³ General population - Dermal; Short term : 111 µg/cm ² General population - Inhalation; Long term : 8.33 mg/m ³ General population - Oral; Long term : 4.76 mg/kg
PNEC	Fresh water; 5.4 µg/l marine water; 0.54 µg/l STP; 1.8 mg/l Sediment (Freshwater); 1.649 mg/kg/day Sediment (Marinewater); 0.165 mg/kg/day Soil; 0.328 mg/kg

GERANYL ACETATE (CAS: 105-87-3)

DNEL	Workers - Inhalation; Long term systemic effects: 62.59 mg/m ³ Workers - Dermal; Long term systemic effects: 35.5 mg/kg Consumer - Inhalation; Long term systemic effects: 15.4 mg/m ³ Consumer - Dermal; : 17.75 mg/kg Consumer - Oral; : 8.9 mg/kg
PNEC	- Fresh water; 3.72 mg/l - marine water; 0.372 mg/l - STP; 8 mg/l - Sediment (Freshwater); 0.442 mg/kg - Sediment (Marinewater); 0.0442 mg/kg - Soil; 0.0859 mg/kg

p-MENTHA-1,4(8)-DIENE (CAS: 586-62-9)

DNEL	Workers - Inhalation; Long term systemic effects: 5.12 mg/m ³ Workers - Dermal; Long term systemic effects: 1.45 mg/kg/day Consumer - Inhalation; Long term systemic effects: 1.26 mg/m ³ Consumer - Dermal; Long term systemic effects: 0.73 mg/kg/day Consumer - Oral; Long term systemic effects: 0.73 mg/kg/day
PNEC	Fresh water; 5.2 µg/l marine water; 0.52 µg/l STP; 3 mg/l Sediment (Freshwater); 0.581 mg/kg Sediment (Marinewater); 58.1 mg/kg Soil; 113 µg/l

LINALOOL (CAS: 78-70-6)

Ingredient comments	No exposure limits known for ingredient(s).
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DNEL	Industry - Dermal; Short term systemic effects: 5 mg/kg/day Industry - Inhalation; Short term systemic effects: 16.5 mg/m ³ Industry - Dermal; Long term systemic effects: 2.5 mg/kg/day Industry - Inhalation; Long term systemic effects: 2.8 mg/m ³ Consumer - Dermal; Short term systemic effects: 2.5 mg/kg/day Consumer - Inhalation; Short term systemic effects: 4.1 mg/m ³ Consumer - Oral; Short term systemic effects: 1.2 mg/kg/day Consumer - Inhalation; Long term systemic effects: 0.7 mg/m ³ Consumer - Oral; Long term systemic effects: 0.2 mg/kg/day Consumer - Dermal; Short term local effects: 15 mg/cm ² Workers - Dermal; Long term local effects: 15 mg/cm ² Consumer - Dermal; Long term local effects: 15 mg/cm ²
PNEC	- Fresh water; 0.2 mg/l - marine water; 0.02 mg/l - Sediment (Freshwater); 2.22 mg/kg - Sediment (Marinewater); 0.222 mg/kg - Soil; 0.327 mg/kg - STP; > 10 mg/l

CITRONELLAL (CAS: 106-23-0)

DNEL	Workers - Dermal; Long term systemic effects: 1.7 mg/kg Workers - Dermal; Long term local effects: 0.14 mg/cm ² Workers - Inhalation; Long term systemic effects: 9 mg/m ³ Consumer - Dermal; Long term systemic effects: 1 mg/kg Consumer - Dermal; Short term local effects: 0.14 mg/cm ² Consumer - Inhalation; Long term systemic effects: 2.7 mg/m ³ Consumer - Oral; Long term systemic effects: 0.6 mg/kg
PNEC	Fresh water; 0.00868 mg/l marine water; 0.00087 mg/l Soil; 0.0267 mg/l STP; 4 mg/l

OCTANAL (CAS: 124-13-0)

DNEL	Workers - Inhalation; Long term systemic effects: 1.3 mg/m ³ Workers - Dermal; Long term systemic effects: 0.37 mg/kg/day Consumer - Inhalation; Long term systemic effects: 0.32 mg/m ³ Consumer - Dermal; Long term systemic effects: 0.19 mg/kg/day Consumer - Oral; Long term systemic effects: 0.19 mg/kg/day
PNEC	Fresh water; 0.00154 mg/l marine water; 0.000154 mg/l STP; 3.16 mg/l

DECANAL (CAS: 112-31-2)

DNEL	Industry - Inhalation; Long term systemic effects: 24.9 mg/m ³ Industry - Dermal; Long term systemic effects: 7 mg/kg/day Consumer - Inhalation; Long term systemic effects: 6.1 mg/m ³ Consumer - Dermal; Long term systemic effects: 3.5 mg/kg/day Consumer - Oral; Long term systemic effects: 3.5 mg/kg/day
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PNEC

- Fresh water; 0.00117 mg/l
- marine water; 0.000117 mg/l
- STP; 3.16 mg/l

8.2. Exposure controls

Protective equipment



Eye/face protection

Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. Tight-fitting safety glasses. Personal protective equipment for eye and face protection should comply with European Standard EN166.

Hand protection

The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. To protect hands from chemicals, gloves should comply with European Standard EN374.

Other skin and body protection

Wear appropriate clothing to prevent any possibility of skin contact.

Hygiene measures

Wash at the end of each work shift and before eating, smoking and using the toilet. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site.

Respiratory protection

Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. If ventilation is inadequate, suitable respiratory protection must be worn. EN 136/140/141/145/143/149

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Yellow. or Green.
Odour	Characteristic.
Odour threshold	No information available.
pH	No information available.
Melting point	No information available.
Initial boiling point and range	No information available.
Flash point	51°C
Evaporation rate	No information available.
Evaporation factor	No information available.
Flammability (solid, gas)	No information available.
Upper/lower flammability or explosive limits	No information available.
Other flammability	No information available.
Vapour pressure	No information available.

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Vapour density	No information available.
Relative density	0.850 @ 20°C
Bulk density	No information available.
Solubility(ies)	No information available.
Partition coefficient	No information available.
Auto-ignition temperature	No information available.
Decomposition Temperature	No information available.
Viscosity	No information available.
Explosive properties	Not considered to be explosive.
Explosive under the influence of a flame	No information available.
Oxidising properties	Does not meet the criteria for classification as oxidising.

9.2. Other information

Refractive index	No information available.
Particle size	No information available.
Molecular weight	No information available.
Volatility	No information available.
Saturation concentration	No information available.
Critical temperature	No information available.
Volatile organic compound	No information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	No test data specifically related to reactivity available for this product or its ingredients.
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10.2. Chemical stability

Stability	Stable at normal ambient temperatures and when used as recommended.
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10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Under normal conditions of storage and use, no hazardous reactions will occur.
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10.4. Conditions to avoid

Conditions to avoid	Avoid exposure to high temperatures or direct sunlight.
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10.5. Incompatible materials

Materials to avoid	Oxidising agents.
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10.6. Hazardous decomposition products

Hazardous decomposition products	Does not decompose when used and stored as recommended. Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours.
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SECTION 11: Toxicological information

11.1. Information on toxicological effects

LEMON OIL

Acute toxicity - oral

ATE oral (mg/kg) 23,474.18

Skin corrosion/irritation

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/irritation

Serious eye damage/irritation No information available.

Respiratory sensitisation

Respiratory sensitisation No information available.

Skin sensitisation

Skin sensitisation May cause an allergic skin reaction.

Germ cell mutagenicity

Genotoxicity - in vitro No information available.

Carcinogenicity

Carcinogenicity No information available.

Reproductive toxicity

Reproductive toxicity - fertility No information available.

Reproductive toxicity - development No information available.

Specific target organ toxicity - single exposure

STOT - single exposure No information available.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure No information available.

Aspiration hazard

Aspiration hazard May be fatal if swallowed and enters airways.

Inhalation Gas or vapour in high concentrations may irritate the respiratory system.

Ingestion May be fatal if swallowed and enters airways. Ingestion may cause severe irritation of the mouth, the oesophagus and the gastrointestinal tract.

Skin contact Causes skin irritation. May cause an allergic skin reaction.

Eye contact May cause temporary eye irritation.

Toxicological information on ingredients.

LIMONENE

Skin corrosion/irritation

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/irritation

Serious eye damage/irritation No information available.

Respiratory sensitisation

Respiratory sensitisation No information available.

LEMON OIL

Skin sensitisation

Skin sensitisation May cause an allergic skin reaction.

Germ cell mutagenicity

Genotoxicity - in vitro No information available.

Carcinogenicity

Carcinogenicity No information available.

Reproductive toxicity

Reproductive toxicity - fertility No information available.

Specific target organ toxicity - single exposure

STOT - single exposure No information available.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure No information available.

Aspiration hazard

Aspiration hazard No information available.

Inhalation Irritating to respiratory system. May cause damage to mucous membranes in nose, throat, lungs and bronchial system.

Ingestion Liquid irritates mucous membranes and may cause abdominal pain if swallowed.

Skin contact Irritating to skin. May cause an allergic skin reaction.

Eye contact May cause temporary eye irritation.

PIN-2-(10) ENE

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg) 5,000.0

Species Rat

Notes (oral LD₅₀) LD₅₀ 5000 mg/kg, Oral, Rat

ATE oral (mg/kg) 5,000.0

Acute toxicity - dermal

Acute toxicity dermal (LD₅₀ mg/kg) 5,000.0

Species Rabbit

Notes (dermal LD₅₀) LD₅₀ 5000 mg/kg, Dermal, Rabbit

ATE dermal (mg/kg) 5,000.0

Aspiration hazard

Aspiration hazard May be fatal if swallowed and enters airways. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

LEMON OIL

Inhalation	Irritating to respiratory system.
Ingestion	Gastrointestinal symptoms, including upset stomach.
Skin contact	Irritating to skin.
Eye contact	Irritating to eyes.

2-PINENE

Acute toxicity - oral

Acute toxicity oral (LD ₅₀ mg/kg)	500.0
Species	Rat
Notes (oral LD ₅₀)	LD ₅₀ 3700 mg/kg, Oral, Rat
ATE oral (mg/kg)	500.0

Acute toxicity - dermal

Acute toxicity dermal (LD ₅₀ mg/kg)	5,000.0
Species	Rat
Notes (dermal LD ₅₀)	LD ₅₀ 5000 mg/kg, Dermal, Rat
ATE dermal (mg/kg)	5,000.0

Inhalation	May cause respiratory system irritation.
Ingestion	Harmful: may cause lung damage if swallowed.
Skin contact	May cause sensitisation by skin contact.
Eye contact	Irritating to eyes.

MYRCENE

Acute toxicity - oral

Notes (oral LD ₅₀)	LD ₅₀ > 5000 mg/kg, Oral, Rat
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Acute toxicity - dermal

Notes (dermal LD ₅₀)	LD ₅₀ > 5000 mg/kg, Dermal, Rabbit
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GERANYL ACETATE

Acute toxicity - oral

Acute toxicity oral (LD ₅₀ mg/kg)	6,330.0
Species	Rat
Notes (oral LD ₅₀)	LD ₅₀ 6330 mg/kg, Oral, Rat
ATE oral (mg/kg)	6,330.0

Acute toxicity - dermal

LEMON OIL

Acute toxicity dermal (LD₅₀ 5,460.0 mg/kg)

Species Rabbit

Notes (dermal LD₅₀) LD₅₀ 5460 mg/kg, Dermal, Rabbit

ATE dermal (mg/kg) 5,460.0

Skin corrosion/irritation

Skin corrosion/irritation Irritating to skin. Rabbit

Skin sensitisation

Skin sensitisation Local Lymph Node Assay (LLNA) - Mouse: Sensitising.

p-MENTHA-1,4(8)-DIENE

Acute toxicity - oral

Notes (oral LD₅₀) LD₅₀ 3850 mg/kg, Oral, Rat

Acute toxicity - dermal

Notes (dermal LD₅₀) LD₅₀ > 2000 mg/kg, Dermal, Rabbit

Skin sensitisation

Skin sensitisation May cause an allergic skin reaction.
Guinea pig maximization test (GPMT) - Guinea pig: Sensitising.

Germ cell mutagenicity

Genotoxicity - in vitro Bacterial reverse mutation test: Negative.

Aspiration hazard

Aspiration hazard May be fatal if swallowed and enters airways.

PARA CYMENE

Acute toxicity - oral

Acute toxicity oral (LD₅₀ 3,669.0 mg/kg)

Species Rat

Notes (oral LD₅₀) LD₅₀ 3669 mg/kg, Oral, Rat

ATE oral (mg/kg) 3,669.0

Acute toxicity - inhalation

ATE inhalation (vapours mg/l) 3.0

Aspiration hazard

Aspiration hazard May be fatal if swallowed and enters airways.

Inhalation Gas or vapour in high concentrations may irritate the respiratory system. Symptoms following overexposure may include the following: Coughing.

Ingestion May be fatal if swallowed and enters airways.

LEMON OIL

Skin contact	Liquid may irritate skin. Repeated exposure may cause skin dryness or cracking.
Eye contact	Vapour or spray in the eyes may cause irritation and smarting.

CARYOPHYLLENE

Skin sensitisation

Skin sensitisation	May cause an allergic skin reaction.
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Germ cell mutagenicity

Genotoxicity - in vitro	Bacterial reverse mutation test: Negative.
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Aspiration hazard

Aspiration hazard	May be fatal if swallowed and enters airways.
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Toxicokinetics

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.

ALPHA-TERPINENE

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg)	680.0
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Species	Rat
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ATE oral (mg/kg)	680.0
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Aspiration hazard

Aspiration hazard	May be fatal if swallowed and enters airways.
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1-METHYL 4-ISO PROPYL-1-CYCLOHEXEN-8-OL

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg)	4,300.0
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Species	Rat
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Notes (oral LD₅₀)	LD ₅₀ 4300 mg/kg, Oral, Rat
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ATE oral (mg/kg)	4,300.0
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Acute toxicity - dermal

Notes (dermal LD₅₀)	LD ₅₀ > 3000 mg/kg, Dermal, Rabbit
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Skin corrosion/irritation

Skin corrosion/irritation	Irritating to skin. Rabbit
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Serious eye damage/irritation

Serious eye damage/irritation	Irritating to eyes. Rabbit
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Skin sensitisation

LEMON OIL

Skin sensitisation Guinea pig maximization test (GPMT) - Guinea pig: Not sensitising.

Germ cell mutagenicity

Genotoxicity - in vitro Bacterial reverse mutation test: Negative.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure NOAEL 314 mg/kg, Oral, Rat (90 days ; 7 days/week)

LINALOOL

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg) 2,790.0

Species Rat

Notes (oral LD₅₀) LD₅₀ 2790 mg/kg, Oral, Rat

Acute toxicity - dermal

Acute toxicity dermal (LD₅₀ mg/kg) 5,610.0

Species Rabbit

Notes (dermal LD₅₀) LD₅₀ 5610 mg/kg, Dermal, Rabbit

Skin corrosion/irritation

Skin corrosion/irritation Irritating to skin. Rabbit

Serious eye damage/irritation

Serious eye damage/irritation Slightly irritating. Rabbit

Skin sensitisation

Skin sensitisation May cause an allergic skin reaction. - Rabbit: Sensitising.

Germ cell mutagenicity

Genotoxicity - in vitro Bacterial reverse mutation test: Negative.

Carcinogenicity

Carcinogenicity No information available.

Reproductive toxicity

Reproductive toxicity - fertility No information available.

Specific target organ toxicity - single exposure

STOT - single exposure No information available.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure NOAEL 117 mg/kg, Oral, Rat NOAEL 250 mg/kg, Dermal, Rat

Aspiration hazard

Aspiration hazard No information available.

LEMON OIL

Toxicokinetics	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.
Inhalation	May cause respiratory irritation.
Ingestion	Ingestion may cause severe irritation of the mouth, the oesophagus and the gastrointestinal tract.
Skin contact	Irritating to skin. May cause an allergic skin reaction.
Eye contact	Causes eye irritation.

CITRONELLAL

Acute toxicity - oral

Notes (oral LD₅₀) LD₅₀ 2420 mg/kg, Oral, Rat

Acute toxicity - inhalation

Notes (inhalation LC₅₀) LD₅₀ > 2500 mg/kg, Dermal, Rabbit

Skin corrosion/irritation

Skin corrosion/irritation Causes skin irritation.
Irritating to skin. Rabbit

Serious eye damage/irritation

Serious eye damage/irritation Causes serious eye irritation.
Irritating to eyes. Rabbit

Skin sensitisation

Skin sensitisation May cause an allergic skin reaction. Guinea pig maximization test (GPMT) - Guinea pig: Sensitising.

Germ cell mutagenicity

Genotoxicity - in vitro Bacterial reverse mutation test: Negative.

NONANAL

Skin corrosion/irritation

Skin corrosion/irritation No information available.

Serious eye damage/irritation

Serious eye damage/irritation No information available.

Respiratory sensitisation

Respiratory sensitisation No information available.

Skin sensitisation

Skin sensitisation No information available.

Germ cell mutagenicity

Genotoxicity - in vitro No information available.

Carcinogenicity

Carcinogenicity No information available.

LEMON OIL

Reproductive toxicity

Reproductive toxicity - fertility No information available.

Reproductive toxicity - development No information available.

Specific target organ toxicity - single exposure

STOT - single exposure No information available.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure No information available.

Aspiration hazard

Aspiration hazard No information available.

Inhalation Vapour may irritate respiratory system/lungs.

Ingestion Gastrointestinal symptoms, including upset stomach.

Skin contact May be slightly irritating to skin.

Eye contact May cause temporary eye irritation.

OCTANAL

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg) 4,617.0

Species Rat

Notes (oral LD₅₀) LD₅₀ 4617 mg/kg, Oral, Rat

ATE oral (mg/kg) 4,617.0

Acute toxicity - dermal

Acute toxicity dermal (LD₅₀ mg/kg) 5,207.0

Species Rabbit

Notes (dermal LD₅₀) LD₅₀ 5207 mg/kg, Dermal, Rabbit

ATE dermal (mg/kg) 5,207.0

Skin corrosion/irritation

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/irritation

Serious eye damage/irritation No information available.

Respiratory sensitisation

Respiratory sensitisation No information available.

Skin sensitisation

LEMON OIL

Skin sensitisation	Guinea pig maximization test (GPMT) - Guinea pig: Not sensitising.
<u>Germ cell mutagenicity</u>	
Genotoxicity - in vitro	Bacterial reverse mutation test: Negative., OECD 471 Gene mutation: Negative., OECD 476
<u>Carcinogenicity</u>	
Carcinogenicity	No information available.
<u>Reproductive toxicity</u>	
Reproductive toxicity - fertility	Fertility - Dose level: (3d/w) 300 mg/kg, Oral, Rat, Female Negative.
Reproductive toxicity - development	Maternal toxicity:, Developmental toxicity: - Dose level:: (3d/w) 300 mg/kg, Oral, Rat, Female, Negative. Teratogenicity: - Dose level:: (9d) 1500 mg/kg, Oral, Rat, Female, Negative.
<u>Specific target organ toxicity - single exposure</u>	
STOT - single exposure	No information available.
<u>Specific target organ toxicity - repeated exposure</u>	
STOT - repeated exposure	NOAEL > 37 mg/kg, Oral, Rat
<u>Aspiration hazard</u>	
Aspiration hazard	No information available.
<u>Inhalation</u>	
Inhalation	Gas or vapour in high concentrations may irritate the respiratory system.
<u>Ingestion</u>	
Ingestion	Ingestion may cause severe irritation of the mouth, the oesophagus and the gastrointestinal tract.
<u>Skin contact</u>	
Skin contact	Causes skin irritation. May cause an allergic skin reaction.
<u>Eye contact</u>	
Eye contact	Causes serious eye irritation.

DECANAL

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg)	33,320.0
Species	Rat

ATE oral (mg/kg)	33,320.0
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Acute toxicity - dermal

Acute toxicity dermal (LD₅₀ mg/kg)	5,040.0
Species	Rabbit

ATE dermal (mg/kg)	5,040.0
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Skin corrosion/irritation

Animal data	Erythema/eschar score: Well defined erythema (2).
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Serious eye damage/irritation

LEMON OIL

Serious eye damage/irritation Causes serious eye irritation. Conjunctivae score: 2 Rabbit

Respiratory sensitisation

Respiratory sensitisation Not sensitising.

Skin sensitisation

Skin sensitisation - Human: Not sensitising.

Germ cell mutagenicity

Genotoxicity - in vitro Bacterial reverse mutation test: Negative. OECD 471
DNA damage and/or repair: Negative. OECD 474

Reproductive toxicity

Reproductive toxicity - fertility This substance has no evidence of toxicity to reproduction.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure NOAEL (90d) 20,000 mg/kg, Oral, Rat

Toxicokinetics 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.

p-MENTHA-1,5-DIENE

Inhalation May cause respiratory system irritation.

Ingestion Swallowing concentrated chemical may cause severe internal injury.

Skin contact Irritating to skin. May cause sensitisation by skin contact.

Eye contact Irritating to eyes.

SECTION 12: Ecological information

Ecotoxicity Toxic to aquatic life with long lasting effects.

Ecological information on ingredients.

LIMONENE

Ecotoxicity Very toxic to aquatic life with long lasting effects.

PIN-2-(10) ENE

Ecotoxicity Very toxic to aquatic life with long lasting effects.

2-PINENE

Ecotoxicity The product contains a substance which is toxic to aquatic organisms and which may cause long-term adverse effects in the aquatic environment.

PARA CYMENE

LEMON OIL

Ecotoxicity Toxic to aquatic life with long lasting effects.

CARYOPHYLLENE

Ecotoxicity May cause long lasting harmful effects to aquatic life.

LINALOOL

Ecotoxicity The product components are not classified as environmentally hazardous. However, large or frequent spills may have hazardous effects on the environment.

NONANAL

Ecotoxicity Harmful to aquatic life with long lasting effects.

OCTANAL

Ecotoxicity Toxic to aquatic life with long lasting effects.

p-MENTHA-1,5-DIENE

Ecotoxicity The product contains a substance which is toxic to aquatic organisms and which may cause long-term adverse effects in the aquatic environment.

12.1. Toxicity

Toxicity Toxic to aquatic life.

Ecological information on ingredients.

LIMONENE

Toxicity Very toxic to aquatic organisms.

Acute aquatic toxicity

LE(C)₅₀ 0.1 < L(E)C₅₀ ≤ 1

M factor (Acute) 1

Acute toxicity - fish LC₅₀, 96 hours: 0.702 - 0.720 mg/l, Pimephales promelas (Fat-head Minnow)

Acute toxicity - aquatic invertebrates EC₅₀, 48 hours: 70 mg/l, Daphnia magna

Acute toxicity - aquatic plants ErC₅₀, 72 hours: 8 mg/l, Algae

Chronic aquatic toxicity

M factor (Chronic) 1

Chronic toxicity - aquatic invertebrates NOEC, 21 days: 0.27 mg/l, Daphnia magna

PIN-2-(10) ENE

Acute aquatic toxicity

LE(C)₅₀ 0.1 < L(E)C₅₀ ≤ 1

M factor (Acute) 1

LEMON OIL

Acute toxicity - aquatic invertebrates LC₅₀, 48 hour: 2.2 mg/l, Daphnia magna

Chronic aquatic toxicity

M factor (Chronic) 1

2-PINENE

Acute aquatic toxicity

LE(C)₅₀ 0.1 < L(E)C₅₀ ≤ 1

M factor (Acute) 1

Acute toxicity - aquatic invertebrates LC₅₀, 48 hour: 6.74 mg/l, Daphnia magna

Chronic aquatic toxicity

NOEC 0.01 < NOEC ≤ 0.1

Degradability Non-rapidly degradable

M factor (Chronic) 1

GERANYL ACETATE

Acute aquatic toxicity

Acute toxicity - fish LC₅₀, 96 hours: 68.12 mg/l, Fish
OECD 203

Acute toxicity - aquatic invertebrates EC₅₀, 48 hours: 14.1 mg/l, Daphnia magna
OECD 202

Acute toxicity - aquatic plants IC₅₀, 72 hours: 3.72 mg/l,
OECD 201
NOEC, 72 hour: 0.585 mg/l, Algae
OECD 201

p-MENTHA-1,4(8)-DIENE

Acute aquatic toxicity

LE(C)₅₀ 0.1 < L(E)C₅₀ ≤ 1

M factor (Acute) 1

Acute toxicity - fish LC₅₀, 96 hours: 0.72 - 6.104 mg/l, Fish

Acute toxicity - aquatic invertebrates EC₅₀, 48 hour: 5.184 mg/kg, Daphnia magna

Acute toxicity - aquatic plants EC₅₀, 72 hour: 5.4 mg/l, Algae
Chronic, NOEC, 72 hour: 3.47 mg/l, Algae

Chronic aquatic toxicity

M factor (Chronic) 1

PARA CYMENE

Toxicity Toxic to aquatic life.

LEMON OIL

Acute aquatic toxicity

Acute toxicity - fish	LC ₅₀ , 96 hour: 48 ppm, Fish
Acute toxicity - aquatic invertebrates	LC ₅₀ , 48 hour: 6500 µg/l, Daphnia magna

CARYOPHYLLENE

Toxicity	May cause long lasting harmful effects to aquatic life.
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ALPHA-TERPINENE

Acute aquatic toxicity

Acute toxicity - fish	LC ₅₀ , 96 hours: 1.48 mg/l, Pimephales promelas (Fat-head Minnow)
Acute toxicity - aquatic invertebrates	EC ₅₀ , 48 hours: 1.85 mg/l, Daphnia magna

1-METHYL 4-ISO PROPYL-1-CYCLOHEXEN-8-OL

Acute aquatic toxicity

Acute toxicity - fish	LC ₅₀ , 96 hour: 70 mg/l, Fish OECD 203
Acute toxicity - aquatic invertebrates	EC ₅₀ , 48 hour: 73 mg/l, Daphnia magna OECD 202
Acute toxicity - aquatic plants	EC ₅₀ , 72 hour: 68 mg/l, Algae OECD 201 Chronic, NOEC, 72 hour: 3.9 mg/l, Algae OECD 201

LINALOOL

Toxicity	Not considered toxic to fish.
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Acute aquatic toxicity

Acute toxicity - fish	LC ₅₀ , 96 hours: 27.8 mg/l, Fish OECD 203
Acute toxicity - aquatic invertebrates	EC ₅₀ , 48 hours: 59 mg/l, Daphnia magna
Acute toxicity - aquatic plants	IC ₅₀ , 72 hours: 156.7 mg/l, Algae

CITRONELLAL

Acute aquatic toxicity

Acute toxicity - fish	LC ₅₀ , 96 hour: 22 mg/l, Fish
Acute toxicity - aquatic invertebrates	EC ₅₀ , 48 hour: 8.7 mg/l, Daphnia magna
Acute toxicity - aquatic plants	IC ₅₀ , 72 hour: 13.33 mg/l, Algae

NONANAL

LEMON OIL

Toxicity Harmful to aquatic life.

(Z)-3,7-DIMETHYLOCTA-1,3,6,-TRIENE

Acute aquatic toxicity

LE(C)₅₀ 0.1 < L(E)C₅₀ ≤ 1

M factor (Acute) 1

OCTANAL

Toxicity Toxic to aquatic life.

Acute aquatic toxicity

Acute toxicity - aquatic invertebrates EC₅₀, 48 hour: 1.54 mg/l, Daphnia magna
OECD 202

Acute toxicity - aquatic plants EC₅₀, 72 hour: 2.9 mg/l, Algae
OECD 201

DECANAL

Acute aquatic toxicity

Acute toxicity - fish LC₅₀, 96 hours: 1.45 mg/l, Freshwater fish
OECD 203

Acute toxicity - aquatic invertebrates EC₅₀, 48 hours: 1.17 mg/l, Daphnia magna
OECD 202

Acute toxicity - aquatic plants EC₅₀, 72 hours: 4.5 mg/l, Freshwater algae
OECD 201
Chronic, NOEC, 72 hour: 0.759 mg/l, Algae
OECD 201

12.2. Persistence and degradability

Persistence and degradability There are no data on the degradability of this product.

Ecological information on ingredients.

LIMONENE

Persistence and degradability The product is not expected to be biodegradable.

PIN-2-(10) ENE

Persistence and degradability The product is readily biodegradable.

2-PINENE

Persistence and degradability The product is readily biodegradable.

GERANYL ACETATE

LEMON OIL

Persistence and degradability

The substance is readily biodegradable.

Biodegradation

- Degradation > 70%: 28 days
OECD 301F

p-MENTHA-1,4(8)-DIENE

Persistence and degradability

The product is readily biodegradable.

Biodegradation

- Degradation 72%: 28 day
OECD 301D

PARA CYMENE

Persistence and degradability

There are no data on the degradability of this product.

1-METHYL 4-ISO PROPYL-1-CYCLOHEXEN-8-OL

Persistence and degradability

The product is readily biodegradable.

Biodegradation

- Degradation 80%: 28 day

LINALOOL

Persistence and degradability

The product is readily biodegradable.

Biodegradation

The substance is readily biodegradable.
- Degradation (%) 64.2%: 28 days
OECD 301D

CITRONELLAL

Persistence and degradability

The product is readily biodegradable.

Biodegradation

- Degradation 82%: 28 day
OECD 301B

NONANAL

Persistence and degradability

There are no data on the degradability of this product.

OCTANAL

Persistence and degradability

Inherently biodegradable.

Biodegradation

- Degradation 77%: 28 day
OECD 302C
- Degradation 46%: 28 day
OECD 310

LEMON OIL

DECANAL

Biodegradation The substance is readily biodegradable.
- Degradation 82%: 28 days
OECD 301F

12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

Partition coefficient No information available.

Ecological information on ingredients.

LIMONENE

Bioaccumulative potential BCF: 490 - 1460,

Partition coefficient log Pow: 4.59

GERANYL ACETATE

Bioaccumulative potential Potentially bioaccumulating.

Partition coefficient log Pow: 4.5

p-MENTHA-1,4(8)-DIENE

Bioaccumulative potential Bioaccumulation is unlikely.

Partition coefficient log Pow: 3.7

PARA CYMENE

Bioaccumulative potential No data available on bioaccumulation.

CARYOPHYLLENE

Bioaccumulative potential Potentially bioaccumulating.

Partition coefficient log Pow: 6.23

1-METHYL 4-ISO PROPYL-1-CYCLOHEXEN-8-OL

Bioaccumulative potential Bioaccumulation is unlikely.

Partition coefficient log Pow: 2.67

LINALOOL

Bioaccumulative potential The product is not bioaccumulating.

Partition coefficient log Kow: 2.7

CITRONELLAL

Bioaccumulative potential Bioaccumulation is unlikely.

Partition coefficient log Pow: 3.62

LEMON OIL

NONANAL

Bioaccumulative potential	The product does not contain any substances expected to be bioaccumulating.
Partition coefficient	No information available.

OCTANAL

Bioaccumulative potential	Bioaccumulation is unlikely.
Partition coefficient	log Pow: 3.05

DECANAL

Bioaccumulative potential	May accumulate in soil and water systems. BCF: 190,
Partition coefficient	log Pow: 3.8

12.4. Mobility in soil

Mobility	No information available.
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Ecological information on ingredients.

LIMONENE

Mobility	The product is insoluble in water.
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PIN-2-(10) ENE

Mobility	The product is insoluble in water.
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2-PINENE

Mobility	The product is insoluble in water.
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PARA CYMENE

Mobility	Not determined.
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LINALOOL

Mobility	The product is insoluble in water.
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NONANAL

Mobility	Insoluble in water.
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OCTANAL

Mobility	No information available.
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p-MENTHA-1,5-DIENE

Mobility	The product is insoluble in water.
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12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	This substance is not classified as PBT or vPvB according to current EU criteria.
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LEMON OIL

Ecological information on ingredients.

LIMONENE

Results of PBT and vPvB assessment This substance is not classified as PBT or vPvB according to current EU criteria.

PARA CYMENE

Results of PBT and vPvB assessment This substance is not classified as PBT or vPvB according to current EU criteria.

LINALOOL

Results of PBT and vPvB assessment This substance is not classified as PBT or vPvB according to current EU criteria.

NONANAL

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

OCTANAL

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects None known.

Ecological information on ingredients.

LIMONENE

Other adverse effects No information available.

PARA CYMENE

Other adverse effects No information available.

CARYOPHYLLENE

Other adverse effects 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.

LINALOOL

Other adverse effects 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.

NONANAL

Other adverse effects None known.

LEMON OIL**OCTANAL**

Other adverse effects None known.

DECANAL

Other adverse effects 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 13: Disposal considerations**13.1. Waste treatment methods**

General information Do not puncture or incinerate, even when empty. Empty containers or liners may retain some product residues and hence be potentially hazardous.

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

SECTION 14: Transport information

General Wear protective clothing as described in Section 8 of this safety data sheet.

14.1. UN number

UN No. (ADR/RID) 1197

UN No. (IMDG) 1197

UN No. (ICAO) 1197

UN No. (ADN) 1197

14.2. UN proper shipping name

Proper shipping name (ADR/RID) EXTRACTS, LIQUID

Proper shipping name (IMDG) EXTRACTS, LIQUID

Proper shipping name (ICAO) EXTRACTS, LIQUID

Proper shipping name (ADN) EXTRACTS, LIQUID

14.3. Transport hazard class(es)

ADR/RID class 3

ADR/RID classification code F1

ADR/RID label 3

IMDG class 3

ICAO class/division 3

ADN class 3

Transport labels

LEMON OIL

14.4. Packing group

ADR/RID packing group	III
IMDG packing group	III
ICAO packing group	III
ADN packing group	III

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant



14.6. Special precautions for user

EmS	F-E, S-D
ADR transport category	3
Emergency Action Code	•3YE
Hazard Identification Number (ADR/RID)	33
Tunnel restriction code	(D/E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code No information required.

SECTION 15: Regulatory information

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

EU legislation	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended). Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended). Commission Regulation (EU) No 2015/830 of 28 May 2015. This product may impact SEVESO storage regulations.
Restrictions (Annex XVII Regulation 1907/2006)	This product is/contains a substance that is included in REGULATION (EC) No 1907/2006 (REACH) ANNEX XVII - RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES. Entry number: 3
Seveso Directive - Control of major accident hazards	P5c E2

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

Inventories

LEMON OIL

EU - EINECS/ELINCS

All the ingredients are listed or exempt.

Canada - DSL/NDSL

All the ingredients are listed or exempt.

US - TSCA

All the ingredients are listed or exempt.

Australia - AICS

All the ingredients are listed or exempt.

Korea - KECI

All the ingredients are listed or exempt.

China - IECSC

All the ingredients are listed or exempt.

Philippines – PICCS

All the ingredients are listed or exempt.

SECTION 16: Other information

LEMON OIL

Abbreviations and acronyms used in the safety data sheet

ATE: Acute Toxicity Estimate.
 ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
 ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
 CAS: Chemical Abstracts Service.
 DNEL: Derived No Effect Level.
 IATA: International Air Transport Association.
 IMDG: International Maritime Dangerous Goods.
 Kow: Octanol-water partition coefficient.
 LC₅₀: Lethal Concentration to 50 % of a test population.
 LD₅₀: Lethal Dose to 50% of a test population (Median Lethal Dose).
 PBT: Persistent, Bioaccumulative and Toxic substance.
 PNEC: Predicted No Effect Concentration.
 REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006.
 RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
 vPvB: Very Persistent and Very Bioaccumulative.
 IARC: International Agency for Research on Cancer.
 MARPOL 73/78: International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978.
 cATpE: Converted Acute Toxicity Point Estimate.
 BCF: Bioconcentration Factor.
 BOD: Biochemical Oxygen Demand.
 EC₅₀: 50% of maximal Effective Concentration.
 LOAEC: Lowest Observed Adverse Effect Concentration.
 LOAEL: Lowest Observed Adverse Effect Level.
 NOAEC: No Observed Adverse Effect Concentration.
 NOAEL: No Observed Adverse Effect Level.
 NOEC: No Observed Effect Concentration.
 LOEC: Lowest Observed Effect Concentration.
 DMEL: Derived Minimal Effect Level.
 EL50: Exposure Limit 50
 hPa: Hectopascal
 LL50: Lethal Loading fifty
 OECD: Organisation for Economic Co-operation and Development
 POW: Octanol-water partition coefficient
 SCBA: self-contained breathing apparatus
 STP: Sewage Treatment Plant
 VOC: Volatile Organic Compounds

Classification abbreviations and acronyms

Acute Tox. = Acute toxicity
 Aquatic Acute = Hazardous to the aquatic environment (acute)
 Aquatic Chronic = Hazardous to the aquatic environment (chronic)

Key literature references and sources for data

Supplier's information.

Revision comments

NOTE: Lines within the margin indicate significant changes from the previous revision.

Revision date

30/05/2023

Version number

3.000

Supersedes date

26/08/2021

SDS number

55945

LEMON OIL

SDS status	Approved.
Hazard statements in full	H226 Flammable liquid and vapour. H302 Harmful if swallowed. H304 May be fatal if swallowed and enters airways. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H361 Suspected of damaging fertility or the unborn child. H361d Suspected of damaging the unborn child. H400 Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects. H411 Toxic to aquatic life with long lasting effects. H412 Harmful to aquatic life with long lasting effects. H413 May cause long lasting harmful effects to aquatic life.
Signature	Jitendra Panchal

This 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. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.



Exposure scenario Formulation

Identification

Product name	Acetic Acid
REACH registration number	01-2119475328-30-XXXX
CAS number	64-19-7
EC number	200-580-7
EU index number	607-002-00-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Formulation
Process scope	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
Main sector	SU3 Industrial uses
Sector of use	SU10 Formulation [mixing] of preparations and/or re-packaging
<u>Environment</u>	
Environmental release category	ERC2 Formulation into mixture
SPERC	ESVOC SPERC 2.2.v1
<u>Worker</u>	

Formulation

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC5 Mixing or blending in batch processes PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC14 Tableting, compression, extrusion, pelletisation, granulation PROC15 Use as laboratory reagent.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

Environmental release category ERC2 Formulation into mixture

SPERC ESVOC SPERC 2.2.v1

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %.

Amounts used

Daily amount per site: 90 tonnes
Annual amount per site: 30000 tonnes

Environmental factors not influenced by risk management measures

Dilution Receiving surface water flow: 18000 m³/day

Risk management measures

STP type Municipal STP.

STP details Assumed onsite sewage treatment plant flow: 2000 m³/day

2. Conditions of use affecting exposure (Workers - Health 1)

Control of workers exposure

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Storage General exposures (closed systems) With sample collection
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Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %.

Formulation

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Palm of both hands. Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Indoor use.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Locate bulk storage outdoors. Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Provide extract ventilation to points where emissions occur. Efficiency of at least 90%

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Avoid carrying out activities involving exposure for more than 1 hour.

2. Conditions of use affecting exposure (Workers - Health 2)

Control of workers exposure

Process category PROC4 Chemical production where opportunity for exposure arises
PROC5 Mixing or blending in batch processes
PROC14 Tableting, compression, extrusion, pelletisation, granulation
General exposures (open systems) Mixing operations (open systems)

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Palm of both hands. Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Indoor.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Provide extract ventilation to points where emissions occur. Efficiency of at least 90%

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented.

2. Conditions of use affecting exposure (Workers - Health 3)

Control of workers exposure

Formulation

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
	PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
	Bulk transfers Drum/batch transfers Drum and small package filling

Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Concentration of substance in product: 100%

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts	Covers skin contact area up to 960 cm ² . (Default)
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Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at room temperature.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Efficiency of at least 90% Drain down and flush system prior to equipment break-in or maintenance.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Assumes a good basic standard of occupational hygiene is implemented.
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Risk management measures

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.

2. Conditions of use affecting exposure (Workers - Health 4)

Control of workers exposure

Process category	PROC15 Use as laboratory reagent.
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Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Concentration of substance in product: 100%

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts	Palm of one hand. Covers skin contact area up to 240 cm ² .
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Formulation

Other given operational conditions affecting workers exposure

Setting	Indoor use.
Temperature	Assumes activities are at room temperature.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Handle in a fume cupboard or under extract ventilation.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Assumes a good basic standard of occupational hygiene is implemented.
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3. Exposure estimation (Environment 1)

Environmental release category	ERC2 Formulation into mixture
Assessment method	Used EUSES model.
Environmental release	Water: 450 kg/day Air: 2250 kg/day Soil: 0 kg/day
Environmental exposure	Fresh water: Exposure 2.93 mg/l, PNEC 3.058 mg/l, RCR 0.958 freshwater sediment: Exposure 10.9 mg/kg, PNEC 11.36 mg/kg, RCR 0.96 Marine water: Exposure 0.93 mg/l, PNEC 0.3058 mg/l, RCR 0.958 marine sediment: Exposure 1.09 mg/kg, PNEC 1.136 mg/kg, RCR 0.96 Effluent: Exposure 28.4 mg/l, PNEC 85 mg/l, RCR 0.334 Agriculture soil: Exposure 0.123 mg/kg, PNEC 0.478 mg/kg, RCR 0.262

3. Exposure estimation (Health 1)

Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 17.52 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.701 Worker - dermal, long-term - systemic: Exposure 1.371 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 0.2 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 2)

Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 12.51 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.5 Worker - dermal, long-term - systemic: Exposure 0.343 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 0.1 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 3)

Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 12.51 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.5 Worker - dermal, long-term - systemic: Exposure 0.686 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 0.1 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 4)

Formulation

Assessment method

ECETOC TRA v2.0 Worker

Exposure

Worker - inhalation, long-term - local and systemic: Exposure 2.502 mg/m³, DNEL 25 mg/m³, RCR 0.1

Worker - dermal, long-term - systemic: Exposure 0.034 mg/kg/day, DNEL , RCR

Worker - dermal, long-term - local: Exposure 0.01 mg/cm², DNEL , RCR



Exposure scenario Distribution

Identification

Product name	Acetic Acid
REACH registration number	01-2119475328-30-XXXX
CAS number	64-19-7
EC number	200-580-7
EU index number	607-002-00-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Distribution
Process scope	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.
Main sector	SU3 Industrial uses
Sector of use	SU1 Agriculture, forestry, fishery SU2 Mining (including offshore industries) SU4 Manufacture of food products SU5 Manufacture of textiles, leather, fur SU6a Manufacture of wood and wood products SU6b Manufacture of pulp, paper and paper products SU7 Printing and reproduction of recorded media

Environment

Environmental release category	ERC1 Manufacture of the substance ERC2 Formulation into mixture
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Worker

Distribution

Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15 Use as laboratory reagent.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

Environmental release category	ERC1 Manufacture of the substance ERC2 Formulation into mixture
SPERC	ESVOC SPERC 1.1b.v1

Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Covers concentrations up to 100 %. Unless otherwise stated.

Amounts used

Daily amount per site: 1.15 tonnes
Annual amount per site: 340 tonnes

Environmental factors not influenced by risk management measures

Dilution	Receiving surface water flow: 18000 m³/day
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Risk management measures

STP type	Municipal STP.
STP details	Assumed onsite sewage treatment plant flow: 2000 m³/day

2. Conditions of use affecting exposure (Workers - Health 1)

Control of workers exposure

Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
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Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts	Palm of both hands. Covers skin contact area up to 480 cm².
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Other given operational conditions affecting workers exposure

Distribution

Setting	Indoor/outdoor use.
Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Store substance within a closed system. Locate bulk storage outdoors. Handle substance within a closed system. Provide extract ventilation to points where emissions occur. Efficiency of at least 90%
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 1 hour.
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2. Conditions of use affecting exposure (Workers - Health 2)

Control of workers exposure

Process category	PROC4 Chemical production where opportunity for exposure arises PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
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Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts	Palm of both hands. Covers skin contact area up to 480 cm².
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Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at room temperature.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Provide extract ventilation to points where emissions occur. Efficiency of at least 90%
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Assumes a good basic standard of occupational hygiene is implemented.
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2. Conditions of use affecting exposure (Workers - Health 3)

Control of workers exposure

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
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Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Covers concentrations up to 100 %. Unless otherwise stated.

Distribution

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Both hands. Covers skin contact area up to 960 cm².

Other given operational conditions affecting workers exposure

Temperature Assumes activities are at room temperature.

Ventilation rate Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Clear transfer lines prior to de-coupling. Provide extract ventilation to points where emissions occur. Efficiency of at least 90% Drain or remove substance from equipment prior to break-in or maintenance.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

If above technical/organisational control measures are not feasible, then adopt following PPE:
Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Wear suitable gloves tested to EN374.

2. Conditions of use affecting exposure (Workers - Health 4)

Control of workers exposure

Process category PROC15 Use as laboratory reagent.

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Palm of one hand. Covers skin contact area up to 240 cm².

Other given operational conditions affecting workers exposure

Setting Indoor use.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Handle in a fume cupboard or under extract ventilation. Efficiency of at least 90%

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Environment 1)

Distribution

Environmental release category	ERC2 Formulation into mixture
Assessment method	Used EUSES model.
Environmental release	Water: 0.012 kg/day Air: 0.115 kg/day Soil: 0 kg/day
Environmental exposure	Fresh water: Exposure 0.088 mg/l, PNEC 3.058 mg/l, RCR 0.029 freshwater sediment: Exposure 0.327 mg/kg, PNEC 11.36 mg/kg, RCR 0.029 Marine water: Exposure 0.008 mg/l, PNEC 0.3058 mg/l, RCR 0.027 marine sediment: Exposure 0.031 mg/kg, PNEC 1.136 mg/kg, RCR 0.027 Effluent: Exposure 0.000727 mg/l, PNEC 85 mg/l, RCR 0 Agriculture soil: Exposure 0.004 mg/kg, PNEC 0.478 mg/kg, RCR 0.009

3. Exposure estimation (Health 1)

Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - dermal, long-term - systemic: Exposure 1.371 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 0.2 mg/cm ² , DNEL , RCR Worker - inhalation, long-term - local and systemic: Exposure 17.52 mg/m ³ , DNEL , RCR 0.701

3. Exposure estimation (Health 2)

Exposure	Worker - inhalation, long-term - local and systemic: Exposure 12.51 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.5 Worker - dermal, long-term - systemic: Exposure 0.686 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 0.1 mg/cm ² , DNEL , RCR
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3. Exposure estimation (Health 3)

Exposure	Worker - inhalation, long-term - local and systemic: Exposure 17.52 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.701 Worker - dermal, long-term - systemic: Exposure 13.71 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 1 mg/cm ² , DNEL , RCR
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3. Exposure estimation (Health 4)

Exposure	Worker - inhalation, long-term - local and systemic: Exposure 2.502 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.1 Worker - dermal, long-term - systemic: Exposure 0.034 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 0.01 mg/cm ² , DNEL , RCR
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Exposure scenario

Laboratory reagents - Professional

Identification

Product name	Acetic Acid
REACH registration number	01-2119475328-30-XXXX
CAS number	64-19-7
EC number	200-580-7
EU index number	607-002-00-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Laboratory reagents - Professional
Process scope	Use of small quantities within laboratory settings, including material transfers and equipment cleaning.
Main sector	SU22 Professional uses
<u>Environment</u>	
Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
<u>Worker</u>	
Process category	PROC10 Roller application or brushing PROC15 Use as laboratory reagent.

2. Conditions of use affecting exposure (Workers - Health 1)

Control of workers exposure

Process category	PROC15 Use as laboratory reagent.
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Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Laboratory reagents - Professional

Human factors not influenced by risk management

Potentially exposed body parts Palm of one hand. Covers skin contact area up to 240 cm².

Other given operational conditions affecting workers exposure

Setting Indoor use.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Handle in a fume cupboard or under extract ventilation. Provide extract ventilation to points where emissions occur. Efficiency of at least 80%

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented.

2. Conditions of use affecting exposure (Workers - Health 2)

Control of workers exposure

Process category PROC10 Roller application or brushing

Vessel and container cleaning

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

Application duration: 1 hour

Human factors not influenced by risk management

Potentially exposed body parts Both hands. Covers skin contact area up to 960 cm².

Other given operational conditions affecting workers exposure

Setting Indoor use.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Provide extract ventilation to points where emissions occur. Efficiency of at least %

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 1 hour.

Risk management measures

Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

2. Conditions of use affecting exposure (Non-industrial - Environment 1)

Control of environmental exposure (Non-industrial)

Laboratory reagents - Professional

Environmental release category ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)

SPERC ESVOC SPERC 8.17.v1

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Environmental factors not influenced by risk management measures

Dilution Receiving surface water flow: 18000 m³/day

Risk management measures

STP type Municipal STP.

STP details Assumed domestic sewage treatment plant flow: 2000 m³/day

3. Exposure estimation (Environment 1)

Environmental release category ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)

Assessment method Used EUSES model.

Environmental release
Water: 0.275 kg/day
Air: 0 kg/day
Soil: 0 kg/day

Environmental exposure
Fresh water: Exposure 0.09 mg/l, PNEC 3.058 mg/l, RCR 0.029
freshwater sediment: Exposure 0.333 mg/kg, PNEC 11.36 mg/kg, RCR 0.029
Marine water: Exposure 0.008 mg/l, PNEC 0.3058 mg/l, RCR 0.028
marine sediment: Exposure 0.028 mg/kg, PNEC 1.136 mg/kg, RCR 0.028
Effluent: Exposure 0.017 mg/l, PNEC 85 mg/l, RCR 0
Agriculture soil: Exposure 0.004 mg/kg, PNEC 0.478 mg/kg, RCR 0.01

3. Exposure estimation (Health 1)

Process category PROC15 Use as laboratory reagent.

Assessment method ECETOC TRA v2.0 Worker

Exposure
Worker - inhalation, long-term - local and systemic: Exposure 5.004 mg/m³, DNEL 25 mg/m³, RCR 0.2
Worker - dermal, long-term - systemic: Exposure 0.034 mg/kg/day, DNEL , RCR
Worker - dermal, long-term - local: Exposure 0.01 mg/cm², DNEL , RCR

3. Exposure estimation (Health 2)

Process category PROC10 Roller application or brushing

Assessment method ECETOC TRA v2.0 Worker

Exposure
Worker - inhalation, long-term - local and systemic: Exposure 10.01 mg/m³, DNEL 25 mg/m³, RCR 0.4
Worker - dermal, long-term - systemic: Exposure 1.371 mg/kg/day, DNEL , RCR
Worker - dermal, long-term - local: Exposure 0.1 mg/cm², DNEL , RCR



Exposure scenario

Oil field drilling - Industrial

Identification

Product name	Acetic Acid
REACH registration number	01-2119475328-30-XXXX
CAS number	64-19-7
EC number	200-580-7
EU index number	607-002-00-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Oil field drilling - Industrial
Process scope	Oil field well drilling operations (including drilling muds and well cleaning), including material transfers, onsite formulation, well head operations, shaker room activities and related maintenance.
Main sector	SU3 Industrial uses
Sector of use	SU10 Formulation [mixing] of preparations and/or re-packaging
<u>Environment</u>	
Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
SPERC	ESVOC SPERC 4.5a.v1
<u>Worker</u>	
Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Oil field drilling - Industrial

2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

Environmental release category ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

SPERC ESVOC SPERC 4.5a.v1

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Amounts used

Daily amount per site: 5 tonnes

Annual amount per site: 150 tonnes

Environmental factors not influenced by risk management measures

Dilution Receiving surface water flow: 18000 m³/day

Risk management measures

STP type Municipal STP.

STP details Assumed onsite sewage treatment plant flow: 2000 m³/day

2. Conditions of use affecting exposure (Workers - Health 1)

Control of workers exposure

Process category PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

General exposures (closed systems)

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Palm of both hands. Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or:
Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Oil field drilling - Industrial

Technical protective measures Handle substance within a closed system. Use a sampling system designed to control exposure. Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Efficiency of at least 90%

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out operation for more than 4 hours. Avoid carrying out activities involving exposure for more than 15 minutes.

2. Conditions of use affecting exposure (Workers - Health 2)

Control of workers exposure

Process category PROC4 Chemical production where opportunity for exposure arises
General exposures (open systems)

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Palm of both hands. Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or:
Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Efficiency of at least 90% Drill floor operations
Limit the substance content in the product to 25%.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out operation for more than 4 hours.

Risk management measures

Wear suitable gloves tested to EN374.

2. Conditions of use affecting exposure (Workers - Health 3)

Control of workers exposure

Process category PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
Bulk transfers Filling/preparation of equipment from drums or containers. Equipment cleaning and maintenance

Oil field drilling - Industrial

Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts	Both hands. Covers skin contact area up to 960 cm ² .
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Other given operational conditions affecting workers exposure

Setting	Indoor/outdoor use.
Temperature	Assumes activities are at room temperature.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Efficiency of at least 97% Drill floor operations Limit the substance content in the product to 25%.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 1 hour.
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Risk management measures

Wear suitable gloves tested to EN374.

3. Exposure estimation (Environment 1)

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
Assessment method	Used EUSES model.
Environmental release	Water: 350 kg/day Air: 50 kg/day Soil: 0 kg/day
Environmental exposure	Fresh water: Exposure mg/l, PNEC 3.058 mg/l, RCR 0.752 freshwater sediment: Exposure 8.55 mg/kg, PNEC 11.36 mg/kg, RCR 0.753 Marine water: Exposure 0.23 mg/l, PNEC 0.3058 mg/l, RCR 0.752 marine sediment: Exposure 0.853 mg/kg, PNEC 1.136 mg/kg, RCR 0.751 Effluent: Exposure 22.1 mg/l, PNEC 85 mg/l, RCR 0.26 Agriculture soil: Exposure 0.049 mg/kg, PNEC 0.478 mg/kg, RCR 0.104

3. Exposure estimation (Health 1)

Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Assessment method	ECETOC TRA v2.0 Worker

Oil field drilling - Industrial

Exposure	Worker - inhalation, long-term - local and systemic: Exposure 15.76 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.631
	Worker - dermal, long-term - systemic: Exposure 0.343 mg/kg/day, DNEL , RCR
	Worker - combined, short-term - systemic: Exposure 0.1 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 2)

Process category	PROC4 Chemical production where opportunity for exposure arises
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 21.02 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.841
	Worker - dermal, long-term - systemic: Exposure 6.857 mg/kg/day, DNEL , RCR
	Worker - dermal, long-term - local: Exposure 1 mg/m ³ , DNEL , RCR

3. Exposure estimation (Health 3)

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 17.52 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.701
	Worker - dermal, long-term - systemic: Exposure 13.71 mg/kg/day, DNEL , RCR
	Worker - dermal, long-term - local: Exposure 1 mg/cm ² , DNEL , RCR



Exposure scenario

Water treatment chemicals - Professional

Identification

Product name	Acetic Acid
REACH registration number	01-2119475328-30-XXXX
CAS number	64-19-7
EC number	200-580-7
EU index number	607-002-00-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Water treatment chemicals - Professional
Process scope	Covers the use of the substance for the treatment of water in open and closed systems.
Main sector	SU22 Professional uses
<u>Environment</u>	
Environmental release category	ERC8f Widespread use leading to inclusion into/onto article (outdoor)
SPERC	ESVOC SPERC 8.22b.v1
<u>Worker</u>	
Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC13 Treatment of articles by dipping and pouring.

2. Conditions of use affecting exposure (Workers - Health 1)

Control of workers exposure

Water treatment chemicals - Professional

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
	PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
	General exposures (closed systems) Storage

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Palm of one hand. Covers skin contact area up to 240 cm².

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Store substance within a closed system. Use in contained batch processes

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 1 hour.

2. Conditions of use affecting exposure (Workers - Health 2)

Control of workers exposure

Process category	PROC4 Chemical production where opportunity for exposure arises
	General exposures (open systems)

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Palm of both hands. Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Outdoor use.

Temperature Assumes activities are at room temperature.

Water treatment chemicals - Professional

Ventilation rate Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 1 hour.

Risk management measures

Wear suitable gloves tested to EN374.

2. Conditions of use affecting exposure (Workers - Health 3)

Control of workers exposure

Process category PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
 PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
 Drum/batch transfers Equipment maintenance

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Both hands. Covers skin contact area up to 960 cm².

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Use drum pumps. Drain or remove substance from equipment prior to break-in or maintenance. Provide extract ventilation to points where emissions occur. Efficiency of at least 90%

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.
 If above technical/organisational control measures are not feasible, then adopt following PPE:
 Wear a respirator conforming to EN140 with Type A/P2 filter or better.
 Efficiency of at least 90%

2. Conditions of use affecting exposure (Workers - Health 4)

Control of workers exposure

Water treatment chemicals - Professional

Process category PROC13 Treatment of articles by dipping and pouring.

Pouring from small containers

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

Application duration: 4 hours

Human factors not influenced by risk management

Potentially exposed body parts Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Outdoor.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or:
Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Provide extract ventilation to points where emissions occur. Efficiency of at least %

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 4 hours.

Risk management measures

Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

If above technical/organisational control measures are not feasible, then adopt following PPE:

Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Efficiency of at least 90%

2. Conditions of use affecting exposure (Non-industrial - Environment 1)

Control of environmental exposure (Non-industrial)

Environmental release category ERC8f Widespread use leading to inclusion into/onto article (outdoor)

SPERC ESVOC SPERC 8.22b.v1

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Environmental factors not influenced by risk management measures

Dilution Receiving surface water flow: 18000 m³/day

Risk management measures

STP type Municipal STP.

STP details Assumed domestic sewage treatment plant flow: 2000 m³/day

Water treatment chemicals - Professional

3. Exposure estimation (Environment 1)

Environmental release category	ERC8f Widespread use leading to inclusion into/onto article (outdoor)
Assessment method	Used EUSES model.
Environmental release	Water: 3.96 kg/day Air: 0 kg/day Soil: 0 kg/day
Environmental exposure	Fresh water: Exposure 0.113 mg/l, PNEC 3.058 mg/l, RCR 0.037 freshwater sediment: Exposure 0.42 mg/kg, PNEC 11.36 mg/kg, RCR 0.037 Marine water: Exposure 0.011 mg/l, PNEC 0.3058 mg/l, RCR 0.035 marine sediment: Exposure 0.04 mg/kg, PNEC 1.136 mg/kg, RCR 0.035 Effluent: Exposure 0.25 mg/l, PNEC 85 mg/l, RCR 0.003 Agriculture soil: Exposure 0.005 mg/kg, PNEC 0.478 mg/kg, RCR 0.011

3. Exposure estimation (Health 1)

Process category	PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 8.758 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.35 Worker - dermal, long-term - systemic: Exposure 0.343 mg/kg, DNEL , RCR Worker - dermal, long-term - local: Exposure 0.1 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 2)

Process category	PROC4 Chemical production where opportunity for exposure arises
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 17.52 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.701 Worker - combined, short-term - systemic: Exposure 6.857 mg/kg, DNEL , RCR Worker - dermal, long-term - local: Exposure 1 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 3)

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 17.52 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.701 Worker - dermal, long-term - systemic: Exposure 13.71 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 1 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 4)

Process category	PROC13 Treatment of articles by dipping and pouring.
Assessment method	ECETOC TRA v2.0 Worker

Water treatment chemicals - Professional

Exposure

Worker - inhalation, long-term - local and systemic: Exposure 10.51 mg/m³, DNEL 25 mg/m³, RCR 0.42

Worker - dermal, long-term - systemic: Exposure 13.71 mg/kg/day, DNEL , RCR

Worker - dermal, long-term - local: Exposure 2 %, DNEL , RCR



Exposure scenario

Use as cleaning agent - Industrial

Identification

Product name	Acetic Acid
REACH registration number	01-2119475328-30-XXXX
CAS number	64-19-7
EC number	200-580-7
EU index number	607-002-00-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Use as cleaning agent - Industrial
Process scope	Covers the use as a component of cleaning products, including transfer from storage, pouring/unloading from drums or containers and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.
Main sector	SU3 Industrial uses
Sector of use	SU5 Manufacture of textiles, leather, fur
<u>Environment</u>	
Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
SPERC	ESVOC SPERC 4.4a.v1
<u>Worker</u>	

Use as cleaning agent - Industrial

Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC7 Industrial spraying PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC10 Roller application or brushing PROC13 Treatment of articles by dipping and pouring.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
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SPERC	ESVOC SPERC 4.4a.v1
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Amounts used

Daily amount per site: 5 tonnes
Annual amount per site: 100 tonnes

Environmental factors not influenced by risk management measures

Dilution	Receiving surface water flow: 18000 m ³ /day
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Risk management measures

STP type	Municipal STP.
STP details	Assumed onsite sewage treatment plant flow: 2000 m ³ /day

2. Conditions of use affecting exposure (Workers - Health 1)

Control of workers exposure

Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Automated process with (semi) closed systems Application of cleaning products in closed systems
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Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Concentration of substance in product: 100%

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts	Palm of both hands. Covers skin contact area up to 480 cm ² .
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Other given operational conditions affecting workers exposure

Setting	Outdoor.
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Use as cleaning agent - Industrial

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Locate bulk storage outdoors. Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 1 hour.

2. Conditions of use affecting exposure (Workers - Health 2)

Control of workers exposure

Process category PROC4 Chemical production where opportunity for exposure arises
PROC13 Treatment of articles by dipping and pouring.
Use in contained batch processes Degreasing small objects in cleaning station

Product characteristics

Physical state Liquid, vapour pressure > 10 Pa (STP)

Concentration details Covers concentrations up to 100 %.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Palm of both hands. Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Indoor use.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Efficiency of at least 90%

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out operation for more than 4 hours.

2. Conditions of use affecting exposure (Workers - Health 3)

Control of workers exposure

Process category PROC7 Industrial spraying
PROC10 Roller application or brushing
Cleaning with low-pressure washers Cleaning with high-pressure washers Manual Surface cleaning

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Use as cleaning agent - Industrial

Concentration details Concentration of substance in product: 5%

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Hands and forearms. Covers skin contact area up to 1500 cm².

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or:
Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Limit the substance content in the product to 5%.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out operation for more than 4 hours. Avoid carrying out activities involving exposure for more than 1 hour.

Risk management measures

Wear suitable gloves tested to EN374.

2. Conditions of use affecting exposure (Workers - Health 4)

Control of workers exposure

Process category PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
Bulk transfers Filling/preparation of equipment from drums or containers. Equipment cleaning and maintenance

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Both hands. Covers skin contact area up to 960 cm².

Other given operational conditions affecting workers exposure

Setting Indoor.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Use as cleaning agent - Industrial

Technical protective measures Ensure material transfers are under containment or extract ventilation. Drain or remove substance from equipment prior to break-in or maintenance. Provide extract ventilation to points where emissions occur. Efficiency of at least 90%

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Wear suitable gloves tested to EN374.

3. Exposure estimation (Environment 1)

Assessment method	Used EUSES model.
Environmental release	Water: 0.5 kg/day Air: 1500 kg/day Soil: 0 kg/day
Environmental exposure	Fresh water: Exposure 0.091 mg/l, PNEC 3.058 mg/l, RCR 0.03 freshwater sediment: Exposure 0.338 mg/kg, PNEC 11.36 mg/kg, RCR 0.03 Marine water: Exposure 0.009 mg/l, PNEC 0.3058 mg/l, RCR 0.028 marine sediment: Exposure 0.032 mg/kg, PNEC 1.136 mg/kg, RCR 0.028 Effluent: Exposure 0.032 mg/l, PNEC 85 mg/l, RCR 0 Agriculture soil: Exposure 0.007 mg/kg, PNEC 0.478 mg/kg, RCR 0.015

3. Exposure estimation (Health 1)

Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 17.52 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.701 Worker - dermal, long-term - systemic: Exposure 1. mg/kg/day, DNEL , RCR Worker - combined, short-term - systemic: Exposure 0.2 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 2)

Process category	PROC4 Chemical production where opportunity for exposure arises PROC13 Treatment of articles by dipping and pouring.
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 12.51 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.5 Worker - dermal, long-term - systemic: Exposure 0.686 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 0.2 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 3)

Process category	PROC7 Industrial spraying PROC10 Roller application or brushing
Assessment method	ECETOC TRA v2.0 Worker

Use as cleaning agent - Industrial

Exposure	Worker - inhalation, long-term - local and systemic: Exposure 17.52 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.701
	Worker - dermal, long-term - systemic: Exposure mg/kg/day, DNEL , RCR
	Worker - dermal, long-term - local: Exposure 2 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 4)

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 12.51 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.5
	Worker - dermal, long-term - systemic: Exposure 0. mg/kg/day, DNEL , RCR
	Worker - dermal, long-term - local: Exposure 0.1 mg/cm ² , DNEL , RCR



Exposure scenario

Cleaning agents - Professional

Identification

Product name	Acetic Acid
REACH registration number	01-2119475328-30-XXXX
CAS number	64-19-7
EC number	200-580-7
EU index number	607-002-00-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Cleaning agents - Professional
Process scope	Covers the use as a component of cleaning products, including pouring/unloading from drums or containers and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand).
Main sector	SU22 Professional uses
<u>Environment</u>	
Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
SPERC	ESVOC SPERC 8.4b.v1
<u>Worker</u>	

Cleaning agents - Professional

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC10 Roller application or brushing PROC11 Non industrial spraying PROC13 Treatment of articles by dipping and pouring.
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2. Conditions of use affecting exposure (Workers - Health 1)

Control of workers exposure

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises Automated process with (semi) closed systems Semi-automated process (e.g. semi-automatic application of floor care and maintenance products) Application of cleaning products in closed systems
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Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Covers concentrations up to 25 %.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts	Palm of both hands. Covers skin contact area up to 480 cm².
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Other given operational conditions affecting workers exposure

Setting	Indoor/outdoor use.
Temperature	Assumes activities are at room temperature.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Limit the substance content in the product to 25%. Handle substance within a closed system. Provide extract ventilation to points where emissions occur. Efficiency of at least 90%
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Assumes a good basic standard of occupational hygiene is implemented.
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Risk management measures

Cleaning agents - Professional

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.

2. Conditions of use affecting exposure (Workers - Health 2)

Control of workers exposure

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
	Filling/preparation of equipment from drums or containers. Equipment cleaning and maintenance

Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Concentration of substance in product: 25%

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts	Both hands. Covers skin contact area up to 960 cm ² .
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Other given operational conditions affecting workers exposure

Setting	Indoor/outdoor use.
Temperature	Assumes activities are at room temperature.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Limit the substance content in the product to 25%. Drain or remove substance from equipment prior to break-in or maintenance.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 1 hour.
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Risk management measures

Wear suitable respiratory protection (conforming to EN140 with type A filter or better) and gloves (type EN374) if regular skin contact likely.

2. Conditions of use affecting exposure (Workers - Health 3)

Control of workers exposure

Process category	PROC10 Roller application or brushing
	PROC13 Treatment of articles by dipping and pouring.
	Cleaning with low-pressure washers Manual Surface cleaning

Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
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Cleaning agents - Professional

Concentration details Covers concentrations up to 5 %.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Both hands. Covers skin contact area up to 960 cm².

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or:
Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Limit the substance content in the product to 5%.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 4 hours.

Risk management measures

Wear suitable gloves tested to EN374.

2. Conditions of use affecting exposure (Workers - Health 4)

Control of workers exposure

Process category PROC11 Non industrial spraying
Cleaning with high-pressure washers

Product characteristics

Physical state Liquid, vapour pressure > 10 Pa (STP)

Concentration details Covers concentrations up to 5 %.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Hands and forearms. Covers skin contact area up to 1500 cm².

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or:
Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Provide extract ventilation to points where emissions occur.

Organisational measures to prevent/limit releases, dispersion and exposure

Cleaning agents - Professional

Organisational measures Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Efficiency of at least 90%

Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

2. Conditions of use affecting exposure (Non-industrial - Environment 1)

Control of environmental exposure (Non-industrial)

Environmental release category ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

SPERC ESVOC SPERC 8.4b.v1

Environmental factors not influenced by risk management measures

Dilution Receiving surface water flow: 18000 m³/day

Risk management measures

STP type Municipal STP.

STP details Assumed domestic sewage treatment plant flow: 2000 m³/day

3. Exposure estimation (Environment 1)

Environmental release category ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

Assessment method Used EUSES model.

Environmental release
Water: 0 kg/day
Air: 0 kg/day
Soil: 0 kg/day

Environmental exposure
Fresh water: Exposure 0.088 mg/l, PNEC 3.058 mg/l, RCR 0.029
freshwater sediment: Exposure 0.327 mg/kg, PNEC 11.36 mg/kg, RCR 0.029
Marine water: Exposure 0.008 mg/l, PNEC 0.3058 mg/l, RCR 0.027
marine sediment: Exposure 0.031 mg/kg, PNEC 1.136 mg/kg, RCR 0.027
Effluent: Exposure 0.00000834 mg/l, PNEC 85 mg/l, RCR 0
Agriculture soil: Exposure 0.004 mg/kg, PNEC 0.478 mg/kg, RCR 0.009

3. Exposure estimation (Health 1)

Process category
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4 Chemical production where opportunity for exposure arises

Assessment method ECETOC TRA v2.0 Worker

Exposure
Worker - inhalation, long-term - local and systemic: Exposure 22.52 mg/m³, DNEL 25 mg/m³, RCR 0.901
Worker - dermal, long-term - systemic: Exposure 6.857 mg/kg/day, DNEL , RCR
Worker - dermal, long-term - local: Exposure 1 mg/cm², DNEL , RCR

3. Exposure estimation (Health 2)

Cleaning agents - Professional

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 21.02 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.841 Worker - dermal, long-term - systemic: Exposure 13.71 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 1 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 3)

Process category	PROC10 Roller application or brushing PROC13 Treatment of articles by dipping and pouring.
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 21.02 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.841 Worker - dermal, long-term - systemic: Exposure 27.43 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 2 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 4)

Process category	PROC11 Non industrial spraying
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 17.52 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.701 Worker - dermal, long-term - systemic: Exposure 107.1 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 5 mg/cm ² , DNEL , RCR



Exposure scenario

Laboratory reagents - Industrial

Identification

Product name	Acetic Acid
REACH registration number	01-2119475328-30-XXXX
CAS number	64-19-7
EC number	200-580-7
EU index number	607-002-00-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Laboratory reagents - Industrial
Process scope	Use of the substance within laboratory settings, including material transfers and equipment cleaning.
Main sector	SU3 Industrial uses
Sector of use	SU10 Formulation [mixing] of preparations and/or re-packaging

Environment

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
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Worker

Process category	PROC10 Roller application or brushing PROC15 Use as laboratory reagent.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
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Amounts used

Daily amount per site: 0.1 tonnes
Annual amount per site: 2 tonnes

Environmental factors not influenced by risk management measures

Laboratory reagents - Industrial

Dilution Receiving surface water flow: 18000 m³/day

Risk management measures

STP type Municipal STP.

STP details Assumed onsite sewage treatment plant flow: 2000 m³/day

2. Conditions of use affecting exposure (Workers - Health 1)

Control of workers exposure

Process category PROC10 Roller application or brushing
Cleaning

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

Application duration: 1 hour

Human factors not influenced by risk management

Potentially exposed body parts Both hands. Covers skin contact area up to 960 cm².

Other given operational conditions affecting workers exposure

Setting Outdoor.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 1 hour.

Risk management measures

Wear suitable gloves tested to EN374.

2. Conditions of use affecting exposure (Workers - Health 2)

Control of workers exposure

Process category PROC15 Use as laboratory reagent.

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Covers skin contact area up to 240 cm². Palm of one hand.

Other given operational conditions affecting workers exposure

Laboratory reagents - Industrial

Setting	Indoor.
Temperature	Assumes activities are at room temperature.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Handle in a fume cupboard or under extract ventilation.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Environment 1)

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
Assessment method	Used EUSES model.
Environmental release	Water: 2 kg/day Air: 2.5 kg/day Soil: 0 kg/day
Environmental exposure	Fresh water: Exposure 0.101 mg/l, PNEC 3.058 mg/l, RCR 0.033 freshwater sediment: Exposure 0.374 mg/kg, PNEC 11.36 mg/kg, RCR 0.033 Marine water: Exposure 0.01 mg/l, PNEC 0.3058 mg/l, RCR 0.031 marine sediment: Exposure 0.035 mg/kg, PNEC 1.136 mg/kg, RCR 0.031 Effluent: Exposure 0.126 mg/l, PNEC 85 mg/l, RCR 0.001 Agriculture soil: Exposure 0.005 mg/kg, PNEC 0.478 mg/kg, RCR 0.01

3. Exposure estimation (Health 1)

Process category	PROC10 Roller application or brushing
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 17.52 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.701 Worker - dermal, long-term - systemic: Exposure 27.43 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 2 mg/cm ² , DNEL , RCR

3. Exposure estimation (Health 2)

Process category	PROC15 Use as laboratory reagent.
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 2.502 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.1 Worker - combined, short-term - systemic: Exposure 0.034 mg/kg, DNEL , RCR Worker - combined, short-term - systemic: Exposure 0.01 mg/cm ² , DNEL , RCR



Exposure scenario Agrochemicals - Professional

Identification

Product name	Acetic Acid
REACH registration number	01-2119475328-30-XXXX
CAS number	64-19-7
EC number	200-580-7
EU index number	607-002-00-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Agrochemicals - Professional
Process scope	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging, including equipment clean-downs and disposal.
Main sector	SU22 Professional uses
<u>Environment</u>	
Environmental release category	ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
SPERC	ESVOC SPERC 8.11a.v1
<u>Worker</u>	
Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC4 Chemical production where opportunity for exposure arises PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC11 Non industrial spraying PROC13 Treatment of articles by dipping and pouring.

2. Conditions of use affecting exposure (Workers - Health 1)

Control of workers exposure

Agrochemicals - Professional

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
	PROC4 Chemical production where opportunity for exposure arises
	Storage With sample collection Mixing operations (closed systems) Mixing operations (open systems)

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %.

Frequency and duration of use

Application duration: 4 hours

Human factors not influenced by risk management

Potentially exposed body parts Palm of both hands. Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Outdoor.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Ventilation rate Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Locate bulk storage outdoors. Store substance within a closed system. Ensure material transfers are under containment or extract ventilation.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 4 hours.

Risk management measures

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.

2. Conditions of use affecting exposure (Workers - Health 2)

Control of workers exposure

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
	Filling/preparation of equipment from drums or containers. Equipment cleaning and maintenance Disposal of wastes

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %.

Agrochemicals - Professional

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Palm of both hands. Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Limit the substance content in the product to 5%. Use drum pumps. , or: Carefully pour from containers. Drain or remove substance from equipment prior to break-in or maintenance. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out operation for more than 4 hours. Avoid carrying out activities involving exposure for more than 1 hour.

Risk management measures

Wear suitable gloves tested to EN374.

2. Conditions of use affecting exposure (Workers - Health 3)

Control of workers exposure

Process category PROC11 Non industrial spraying

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Avoid using at a product concentration greater than 5%.

Frequency and duration of use

Application duration: 4 hours

Human factors not influenced by risk management

Potentially exposed body parts Hands and forearms. Covers skin contact area up to 1500 cm².

Other given operational conditions affecting workers exposure

Setting Indoor use.

Temperature Assumes activities are at room temperature.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of > 20.

Organisational measures to prevent/limit releases, dispersion and exposure

Agrochemicals - Professional

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out operation for more than 4 hours. Avoid carrying out activities involving exposure for more than 1 hour.

Risk management measures

If above technical/organisational control measures are not feasible, then adopt following PPE:
Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Efficiency of at least 90%
Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

2. Conditions of use affecting exposure (Workers - Health 4)

Control of workers exposure

Process category PROC13 Treatment of articles by dipping and pouring.
Ad hoc manual application via trigger sprays, dipping, etc.

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP
Concentration details Covers concentrations up to 5 %.

Frequency and duration of use

Application duration: 1 hour

Human factors not influenced by risk management

Potentially exposed body parts Palm of both hands. Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Indoor use.
Temperature Assumes activities are at room temperature.
Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Limit the substance content in the product to 5%.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out activities involving exposure for more than 1 hour.

2. Conditions of use affecting exposure (Non-industrial - Environment 1)

Control of environmental exposure (Non-industrial)

Environmental release category ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
SPERC ESVOC SPERC 8.11a.v1

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP
Concentration details Covers concentrations up to 100 %.

Environmental factors not influenced by risk management measures

Agrochemicals - Professional

Dilution Receiving surface water flow: 18000 m³/day

Risk management measures

STP type Municipal STP.

STP details Assumed domestic sewage treatment plant flow: 2000 m³/day

3. Exposure estimation (Environment 1)

Environmental release category ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

Assessment method Used EUSES model.

Environmental release
Water: 0 kg/day
Air: 0 kg/day
Soil: 0 kg/day

Environmental exposure
Fresh water: Exposure 0.089 mg/l, PNEC 3.058 mg/l, RCR 0.029
freshwater sediment: Exposure 0.33 mg/kg, PNEC 11.36 mg/kg, RCR 0.029
Marine water: Exposure 0.008 mg/l, PNEC 0.3058 mg/l, RCR 0.027
marine sediment: Exposure 0.031 mg/kg, PNEC 1.136 mg/kg, RCR 0.027
Effluent: Exposure 0.008 mg/l, PNEC 85 mg/l, RCR 0
Agriculture soil: Exposure 0.004 mg/kg, PNEC 0.478 mg/kg, RCR 0.009

3. Exposure estimation (Health 1)

Process category
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4 Chemical production where opportunity for exposure arises

Assessment method ECETOC TRA v2.0 Worker

Exposure
Worker - inhalation, long-term - local and systemic: Exposure 21.02 mg/m³, DNEL 25 mg/m³, RCR 0.841
Worker - dermal, long-term - systemic: Exposure 6.857 mg/kg/day, DNEL , RCR
Worker - dermal, long-term - local: Exposure 1 mg/cm², DNEL , RCR

3. Exposure estimation (Health 2)

Process category
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Assessment method ECETOC TRA v2.0 Worker

Exposure
Worker - inhalation, long-term - local and systemic: Exposure 21.02 mg/m³, DNEL 25 mg/m³, RCR 0.841
Worker - dermal, long-term - systemic: Exposure 13.71 mg/kg/day, DNEL , RCR
Worker - dermal, long-term - local: Exposure 1 mg/cm², DNEL , RCR

3. Exposure estimation (Health 3)

Process category PROC11 Non industrial spraying

Assessment method ECETOC TRA v2.0 Worker

Agrochemicals - Professional

Exposure Worker - inhalation, long-term - local and systemic: Exposure 15.01 mg/m³, DNEL 25 mg/m³, RCR 0.6
Worker - dermal, long-term - systemic: Exposure 107.1 mg/kg/day, DNEL , RCR
Worker - dermal, long-term - local: Exposure 5 mg/cm², DNEL , RCR

3. Exposure estimation (Health 4)

Process category PROC13 Treatment of articles by dipping and pouring.

Assessment method ECETOC TRA v2.0 Worker

Exposure Worker - inhalation, long-term - local and systemic: Exposure 10.01 mg/m³, DNEL 25 mg/m³, RCR 0.4
Worker - combined, short-term - systemic: Exposure 13.71 mg/kg/day, DNEL , RCR
Worker - dermal, long-term - local: Exposure 2 mg/cm², DNEL , RCR



Exposure scenario

Water treatment chemicals - Industrial

Identification

Product name	Acetic Acid
REACH registration number	01-2119475328-30-XXXX
CAS number	64-19-7
EC number	200-580-7
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Water treatment chemicals - Industrial
Process scope	Covers the use of the substance for the treatment of water at industrial facilities in open and closed systems.
Main sector	SU3 Industrial uses
Sector of use	SU10 Formulation [mixing] of preparations and/or re-packaging
<u>Environment</u>	
Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
SPERC	ESVOC SPERC 3.22a.v1
<u>Worker</u>	
Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC13 Treatment of articles by dipping and pouring.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Water treatment chemicals - Industrial

Control of environmental exposure

Environmental release category ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

SPERC ESVOC SPERC 3.22a.v1

Amounts used

Daily amount per site: 0.1 tonnes

Annual amount per site: 30 tonnes

Environmental factors not influenced by risk management measures

Dilution Receiving surface water flow: 18000 m³/day

Risk management measures

STP type Municipal STP.

STP details Assumed onsite sewage treatment plant flow: 2000 m³/day

2. Conditions of use affecting exposure (Workers - Health 1)

Control of workers exposure

Process category

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

General exposures (closed systems)

Product characteristics

Physical state Liquid, vapour pressure > 10 kPa at STP

Concentration details Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts Palm of both hands. Covers skin contact area up to 480 cm².

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Ventilation rate Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Store substance within a closed system. Handle substance within a closed system.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out operation for more than 4 hours.

2. Conditions of use affecting exposure (Workers - Health 2)

Water treatment chemicals - Industrial

Control of workers exposure

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
	Equipment maintenance Drum/batch transfers

Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Covers concentrations up to 100 %. Unless otherwise stated.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts	Both hands. Covers skin contact area up to 960 cm ² .
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Other given operational conditions affecting workers exposure

Setting	Indoor/outdoor use.
Temperature	Assumes activities are at room temperature.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Use drum pumps. Avoid spillage when withdrawing pump. Drain or remove substance from equipment prior to break-in or maintenance. Provide extract ventilation to points where emissions occur. Efficiency of at least 90%
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Assumes a good basic standard of occupational hygiene is implemented.
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Risk management measures

Wear suitable gloves tested to EN374.

2. Conditions of use affecting exposure (Workers - Health 3)

Control of workers exposure

Process category	PROC4 Chemical production where opportunity for exposure arises
	PROC13 Treatment of articles by dipping and pouring.
	General exposures (open systems) Pouring from small containers

Product characteristics

Physical state	Liquid, vapour pressure > 10 kPa at STP
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

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

Human factors not influenced by risk management

Potentially exposed body parts	Palm of both hands. Covers skin contact area up to 480 cm ² .
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Water treatment chemicals - Industrial

Other given operational conditions affecting workers exposure

Setting	Indoor/outdoor use.
Temperature	Assumes activities are at room temperature.
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Provide extract ventilation to points where emissions occur. Efficiency of at least 90%

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented. Avoid carrying out operation for more than 4 hours.

Risk management measures

Wear suitable gloves tested to EN374.

3. Exposure estimation (Environment 1)

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
Assessment method	Used EUSES model.
Environmental release	Water: 95 kg/day Air: 5 kg/day Soil: 0 kg/day
Environmental exposure	Fresh water: Exposure 0.688 mg/l, PNEC 3.058 mg/l, RCR 0.225 freshwater sediment: Exposure 2.56 mg/kg, PNEC 11.36 mg/kg, RCR 0.225 Marine water: Exposure 0.068 mg/l, PNEC 0.3058 mg/l, RCR 0.223 marine sediment: Exposure 0.254 mg/kg, PNEC 1.136 mg/kg, RCR 0.224 Effluent: Exposure 6.01 mg/l, PNEC 85 mg/l, RCR 0.071 Agriculture soil: Exposure 0.017 mg/kg, PNEC 0.478 mg/kg, RCR 0.035

3. Exposure estimation (Health 1)

Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Assessment method	ECETOC TRA v2.0 Worker
Exposure	Worker - inhalation, long-term - local and systemic: Exposure 21.02 mg/m ³ , DNEL 25 mg/m ³ , RCR 0.841 Worker - dermal, long-term - systemic: Exposure 6.857 mg/kg/day, DNEL , RCR Worker - dermal, long-term - local: Exposure 1 mg/m ³ , DNEL , RCR

3. Exposure estimation (Health 2)

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
Assessment method	ECETOC TRA v2.0 Worker

Water treatment chemicals - Industrial

Exposure Worker - inhalation, long-term - local and systemic: Exposure 12.51 mg/m³, DNEL 25 mg/m³, RCR 0.5
Worker - dermal, long-term - systemic: Exposure 0.686 mg/kg/day, DNEL , RCR
Worker - dermal, long-term - local: Exposure 0.1 mg/cm², DNEL , RCR

3. Exposure estimation (Health 3)

Process category PROC13 Treatment of articles by dipping and pouring.

Assessment method ECETOC TRA v2.0 Worker

Exposure Worker - inhalation, long-term - local and systemic: Exposure 12.51 mg/m³, DNEL 25 mg/m³, RCR 0.5
Worker - dermal, long-term - systemic: Exposure 0.686 mg/kg/day, DNEL , RCR
Worker - dermal, long-term - local: Exposure 0.1 mg/cm², DNEL , RCR