



SAFETY DATA SHEET

1 PROPOXY-2-PROPANOL

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

1.1. Product identifier

Product name	1 PROPOXY-2-PROPANOL
Product number	20256
Synonyms; trade names	DOWANOL PNP GLYCOL ETHER, DOWANOL PNP
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4

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

Identified uses	Industrial Solvent Cleaning agent. Lubricant. Cosmetics For further information, see attached Exposure Scenario.
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1.3. Details of the supplier of the safety data sheet

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
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1.4. Emergency telephone number

Emergency telephone	SGS - +32 (0)3 575 55 55 (24h)
Sds No.	20256

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards	Flam. Liq. 3 - H226
Health hazards	Eye Irrit. 2 - H319
Environmental hazards	Not Classified

2.2. Label elements

EC number	216-372-4
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Hazard pictograms



1 PROPOXY-2-PROPANOL

Signal word	Warning
Hazard statements	H226 Flammable liquid and vapour. H319 Causes serious eye irritation.
Precautionary statements	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. P337+P313 If eye irritation persists: Get medical advice/ attention. P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish. P403+P235 Store in a well-ventilated place. Keep cool.

2.3. Other hazards

This substance is not classified as PBT or vPvB according to current EU criteria.

SECTION 3: Composition/information on ingredients

3.1. Substances

Product name	1 PROPOXY-2-PROPANOL
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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

General information	First aid personnel should wear appropriate protective equipment during any rescue. Wear protective clothing as described in Section 8 of this safety data sheet.
Inhalation	Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Rinse nose and mouth with water. Get medical attention if any discomfort continues.
Ingestion	Rinse mouth thoroughly with water. Do not induce vomiting unless under the direction of medical personnel. Get medical attention if any discomfort continues.
Skin contact	After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Get medical attention if any discomfort continues.
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 immediately. Continue to rinse.

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

Eye contact	Causes serious eye irritation.
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4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor	Treat symptomatically. If in doubt, get medical attention promptly.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.
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5.2. Special hazards arising from the substance or mixture

Specific hazards	Flammable liquid and vapour. Containers can burst violently or explode when heated, due to excessive pressure build-up. When heated and in case of fire, toxic vapours/gases may be formed.
Hazardous combustion products	Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours. Aldehydes. Ketones. Acids - organic. Oxides of the following substances: Carbon.

5.3. Advice for firefighters

Protective actions during firefighting	No action shall be taken without appropriate training or involving any personal risk. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Do not use water jet as an extinguisher, as this will spread the fire. Contain and collect extinguishing water. Avoid the spillage or runoff entering drains, sewers or watercourses. Evacuate area.
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	Provide adequate ventilation. Wear protective clothing as described in Section 8 of this safety data sheet. Follow precautions for safe handling described in this safety data sheet. Avoid inhalation of vapours and contact with skin and eyes. No smoking, sparks, flames or other sources of ignition near spillage. Ground/bond container and receiving equipment. Vapours may form explosive mixtures with air. Keep unnecessary and unprotected personnel away from the spillage.
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6.2. Environmental precautions

Environmental precautions	Do not discharge into drains or watercourses or onto the ground. Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.
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6.3. Methods and material for containment and cleaning up

Methods for cleaning up	Use only non-sparking tools. Absorb spillage with non-combustible, absorbent material. Collect and place in suitable waste disposal containers and seal securely. Label the containers containing waste and contaminated materials and remove from the area as soon as possible.
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6.4. Reference to other sections

Reference to other sections	For personal protection, see Section 8. For waste disposal, see Section 13.
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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions	Provide adequate ventilation. Wear protective clothing as described in Section 8 of this safety data sheet. Follow precautions for safe handling described in this safety data sheet. Avoid inhalation of vapours and contact with skin and eyes. Keep away from heat, sparks and open flame. Empty Container Warning (where applicable): Empty containers may retain residue and can be dangerous. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Container must be kept tightly closed when not in use.
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7.2. Conditions for safe storage, including any incompatibilities

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Storage precautions

Store in tightly-closed, original container in a dry, cool and well-ventilated place. Suitable container materials: Carbon steel. Stainless steel. Unsuitable container materials: Aluminium. Copper. Store away from incompatible materials (see Section 10). Store away from the following materials: Strong acids. Strong alkalis. Strong oxidising agents.

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

Occupational exposure limits

50ppm TWA, Manf. data

75ppm, STEL, Manuf. data

DNEL

Workers - Dermal; Long term systemic effects: 82.5 mg/kg/day
 Workers - Inhalation; Long term systemic effects: 263 mg/m³
 Consumer - Dermal; Long term systemic effects: 36 mg/kg/day
 Consumer - Inhalation; Long term systemic effects: 38 mg/m³
 Consumer - Oral; Long term systemic effects: 11 mg/kg/day

PNEC

- Fresh water; 0.1 mg/l
 - marine water; 0.01 mg/l
 - Intermittent release; 1 mg/l
 - STP; 4 mg/l
 - Sediment (Freshwater); 0.386 mg/kg/day
 - Sediment (Marinewater); 0.0386 mg/kg/day
 - Soil; 0.0185 mg/kg/day

8.2. Exposure controls

Protective equipment



Appropriate engineering controls

Provide adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls as the primary means to minimise worker exposure.

Eye/face protection

Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. The following protection should be worn: Chemical splash goggles. 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. The selected gloves should have a breakthrough time of at least 4 hours. Butyl rubber. Rubber (natural, latex). Neoprene. Nitrile rubber. Polyvinyl chloride (PVC). Thickness: > 0.35 mm To protect hands from chemicals, gloves should comply with European Standard EN374.

Other skin and body protection

Wear appropriate clothing to prevent repeated or prolonged skin contact.

Hygiene measures

When using do not eat, drink or smoke. Wash at the end of each work shift and before eating, smoking and using the toilet. Remove contaminated clothing and protective equipment before entering eating areas. Eye wash facilities and emergency shower must be available when handling this product.

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Respiratory protection	Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. Ensure all respiratory protective equipment is suitable for its intended use and is 'CE'-marked. If ventilation is inadequate, suitable respiratory protection must be worn. Organic vapour filter. Gas filter, type A EN 136/140/141/145/143/149
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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Colourless.
Odour	Ether.
Odour threshold	No information available.
pH	No information available.
Melting point	- 70°C Read-across data.
Pour Point	No information available.
Freezing Point	- 70°C Read-across data.
Initial boiling point and range	149°C @ 1013 hPa Read-across data.
Flash point	46°C Closed cup. Read-across data.
Evaporation rate	No information available.
Evaporation factor	No information available.
Flammability (solid, gas)	No information available.
Upper/lower flammability or explosive limits	Lower flammable/explosive limit: 1.3 % Upper flammable/explosive limit: 10.6 % Read-across data.
Other flammability	No information available.
Vapour pressure	3.8 hPa @ 25°C Read-across data.
Vapour density	No information available.
Relative density	0.8805 @ 25°C Read-across data.
Bulk density	No information available.
Solubility(ies)	> 1000 g/l water @ 30°C Read-across data. Miscible with water.
Partition coefficient	log Pow: 0.621 Calculation method.
Auto-ignition temperature	252°C Read-across data.
Decomposition Temperature	No information available.
Viscosity	2.71 mm ² /s @ 25°C Read-across data.
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.

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Particle size	No information available.
Molecular weight	118.2 Read-across data.
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	There are no known reactivity hazards associated with this product.
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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	Will not polymerise. The product is flammable. Vapours may form explosive mixtures with air.
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10.4. Conditions to avoid

Conditions to avoid	Avoid heat, flames and other sources of ignition. Static electricity and formation of sparks must be prevented.
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10.5. Incompatible materials

Materials to avoid	Strong acids. Strong alkalis. Strong oxidising agents.
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10.6. Hazardous decomposition products

Hazardous decomposition products	Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours. Aldehydes. Ketones. Acids - organic. Oxides of the following substances: Carbon.
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SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral

Notes (oral LD ₅₀)	LD ₅₀ >2000 mg/kg, Oral, Rat
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Acute toxicity - dermal

Notes (dermal LD ₅₀)	LD ₅₀ >2000 mg/kg, Dermal, Rabbit
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Acute toxicity - inhalation

Notes (inhalation LC ₅₀)	LC ₅₀ 8.34 mg/l, 4 hours, Vapour Rat
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Skin corrosion/irritation

Animal data	Repeated exposure may cause skin dryness or cracking.
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Serious eye damage/irritation

Serious eye damage/irritation	Causes serious eye irritation.
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Respiratory sensitisation

Respiratory sensitisation	No information available.
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Skin sensitisation

Skin sensitisation	Not sensitising. Mouse
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Germ cell mutagenicity

Genotoxicity - in vitro Negative.

Carcinogenicity

Carcinogenicity No information available.

Reproductive toxicity

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

Specific target organ toxicity - single exposure

STOT - single exposure Not classified as a specific target organ toxicant after a single exposure.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure No information available.

Aspiration hazard

Aspiration hazard Based on available data the classification criteria are not met.

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

Ingestion May cause discomfort if swallowed.

Skin contact Prolonged skin contact may cause temporary irritation. Repeated exposure may cause skin dryness or cracking.

Eye contact Causes serious eye irritation.

SECTION 12: Ecological information

Ecotoxicity The product is not expected to be hazardous to the environment. However, large or frequent spills may have hazardous effects on the environment.

12.1. Toxicity

Acute aquatic toxicity

Acute toxicity - fish LC₅₀, 96 hours: >100 mg/l, *Oncorhynchus mykiss* (Rainbow trout)

Acute toxicity - aquatic invertebrates LC₅₀, 48 hours: >100 mg/l, *Daphnia magna*

Acute toxicity - aquatic plants ErC₅₀, 96 hours: 1466 mg/l, *Pseudokirchneriella subcapitata*

Acute toxicity - microorganisms EC₅₀, 16 hours: 3800 mg/l,

12.2. Persistence and degradability

Persistence and degradability The product is readily biodegradable.

Biodegradation - Degradation 91.5%: 28 days

12.3. Bioaccumulative potential

Bioaccumulative potential Bioaccumulation is unlikely. BCF: <100,

Partition coefficient log Pow: 0.621 Calculation method.

12.4. Mobility in soil

Mobility Miscible with water.

12.5. Results of PBT and vPvB assessment

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

12.6. Other adverse effects

Other adverse effects Not determined.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information Waste is classified as hazardous waste. Do not puncture or incinerate, even when empty.

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) 1993

UN No. (IMDG) 1993

UN No. (ICAO) 1993

UN No. (ADN) 1993

14.2. UN proper shipping name

Proper shipping name (ADR/RID) FLAMMABLE LIQUID, N.O.S. (1 PROPOXY-2-PROPANOL)

Proper shipping name (IMDG) FLAMMABLE LIQUID, N.O.S. (1 PROPOXY-2-PROPANOL)

Proper shipping name (ICAO) FLAMMABLE LIQUID, N.O.S. (1 PROPOXY-2-PROPANOL)

Proper shipping name (ADN) FLAMMABLE LIQUID, N.O.S. (1 PROPOXY-2-PROPANOL)

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



14.4. Packing group

ADR/RID packing group III

IMDG packing group III

ICAO packing group III

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ADN packing group III

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

No.

14.6. Special precautions for user

EmS F-E, S-E

ADR transport category 3

Emergency Action Code •3Y

Hazard Identification Number 30
(ADR/RID)

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 Not applicable.

Annex II of MARPOL 73/78
and the IBC Code

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) CAUTION - Chemical may be subject to REACH RESTRICTIONS - see Annex XVII. 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

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information

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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

30/04/2020

Version number

3.000

Supersedes date

02/07/2018

SDS number

20256

1 PROPOXY-2-PROPANOL

SDS status

Approved.

Hazard statements in full

H226 Flammable liquid and vapour.

H319 Causes serious eye irritation.

Signature

Lisa Bland



Exposure scenario

Use as a process solvent

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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 a process solvent
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
SPERC	ESVOC SPERC 4.21a.v1

Worker

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 PROC15 Use as laboratory reagent.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Amounts used

Daily amount per site: 4.2 kg
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 1,111 kg/day

Use as a process solvent

Frequency and duration of use

Emission days: 300 days/year
Continuous release.

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Technical measures Store finished products in closed containers (e.g. bulk tanks, drums, cans). Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 87%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant)
RMMs: 87%

Conditions and measures related to external treatment of waste for disposal

Waste treatment External treatment and disposal of waste should comply with applicable local and/or national regulations. Incinerate, absorb or adsorb vapours stripped from solution whenever necessary.

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

Product characteristics

Physical state Liquid, vapour pressure < 0.5 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).

Other given operational conditions affecting workers exposure

Temperature Assumes activities are at ambient temperature (unless stated differently).

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

Technical protective measures Avoid direct eye contact with product, also via contamination on hands.

Organisational measures to prevent/limit releases, dispersion and exposure

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

Risk management measures

Use suitable eye protection.
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
Wear suitable gloves tested to EN374.

3. Exposure estimation (Environment 1)

Assessment method Used EUSES model.

Environmental exposure Fresh water: Exposure 0.00012 mg/l, PNEC 0.1 mg/l, RCR 0.0012
freshwater sediment: Exposure 0.00047 mg/kg, PNEC 0.386 mg/kg, RCR 0.0012
Marine water: Exposure 0.000017 mg/l, PNEC 0.01 mg/l, RCR 0.0017
marine sediment: Exposure 0.000064 mg/kg, PNEC 0.0386 mg/kg, RCR 0.0017
Soil: Exposure 0.000070 mg/kg, PNEC 0.0185 mg/kg, RCR 0.0038

4. Guidance to check compliance with the exposure scenario (Environment 1)

Use as a process solvent

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures.

3. Exposure estimation (Health 1)

Assessment method	ECETOC TRA v2.0 Worker
Exposure	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions Worker - inhalation, long-term - systemic: Exposure 0.05 mg/m³, DNEL 263 mg/m³, RCR 0.0002 Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004 PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions Worker - inhalation, long-term - systemic: Exposure 4.93 mg/m³, DNEL 263 mg/m³, RCR 0.02 Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02 PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06 Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004 PROC4 Chemical production where opportunity for exposure arises Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09 Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08 PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09 Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08 PROC15 Use as laboratory reagent. Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09 Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.



Exposure scenario

Distribution of substance, Industrial

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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 of substance, Industrial
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC1 Manufacture of the substance ERC2 Formulation into mixture ERC3 Formulation into solid matrix ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC5 Use at industrial site leading to inclusion into/onto article ERC6a Use of intermediate ERC7 Use of functional fluid at industrial site
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SPERC	ESVOC SPERC 1.1b.v1
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Worker

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 PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15 Use as laboratory reagent.
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Distribution of substance, Industrial

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

Amounts used

Daily amount per site: 11000 kg
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 1,075 kg/day

Frequency and duration of use

Emission days: 300 days/year
Continuous release.

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Technical measures Store finished products in closed containers (e.g. bulk tanks, drums, cans). Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 87%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMS: 87%

Conditions and measures related to external treatment of waste for disposal

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

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

Product characteristics

Physical state Liquid, vapour pressure < 0.5 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).

Other given operational conditions affecting workers exposure

Temperature Assumes activities are at ambient temperature (unless stated differently).

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

Technical protective measures Avoid direct eye contact with product, also via contamination on hands.

Organisational measures to prevent/limit releases, dispersion and exposure

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

Risk management measures

Use suitable eye protection.
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
Wear suitable gloves tested to EN374.

3. Exposure estimation (Environment 1)

Assessment method Used EUSES model.

Distribution of substance, Industrial

Environmental exposure

Fresh water: Exposure 0.00081 mg/l, PNEC 0.1 mg/l, RCR 0.0081
freshwater sediment: Exposure 0.0031 mg/kg, PNEC 0.386 mg/kg, RCR 0.0081
Marine water: Exposure 0.000086 mg/l, PNEC 0.01 mg/l, RCR 0.0086
marine sediment: Exposure 0.00033 mg/kg, PNEC 0.0386 mg/kg, RCR 0.0086
Soil: Exposure 0.00038 mg/kg, PNEC 0.0185 mg/kg, RCR 0.020

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures.

3. Exposure estimation (Health 1)

Assessment method

ECETOC TRA v2.0 Worker

Distribution of substance, Industrial

Exposure

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

Worker - inhalation, long-term - systemic: Exposure 0.05 mg/m³, DNEL 263 mg/m³, RCR 0.0002

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

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

Worker - inhalation, long-term - systemic: Exposure 4.93 mg/m³, DNEL 263 mg/m³, RCR 0.02

Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

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

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

PROC4 Chemical production where opportunity for exposure arises

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

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

Worker - inhalation, long-term - systemic: Exposure 49.25 mg/m³, DNEL 263 mg/m³, RCR 0.19

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC15 Use as laboratory reagent.

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.



Exposure scenario

Formulation & (re)packing of substances and mixtures, Industrial

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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 & (re)packing of substances and mixtures, Industrial
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC2 Formulation into mixture
SPERC	ESVOC SPERC 2.2.v1

Worker

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)

Amounts used

Formulation & (re)packing of substances and mixtures, Industrial

Daily amount per site: 2200 kg
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 3,163 kg/day

Frequency and duration of use

Emission days: 300 days/year
Continuous release.

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Technical measures Store finished products in closed containers (e.g. bulk tanks, drums, cans). Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 87%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 87%

Conditions and measures related to external treatment of waste for disposal

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

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

Product characteristics

Physical state Liquid, vapour pressure < 0.5 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).

Other given operational conditions affecting workers exposure

Temperature Assumes activities are at ambient temperature (unless stated differently).

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

Technical protective measures Avoid direct eye contact with product, also via contamination on hands.

Organisational measures to prevent/limit releases, dispersion and exposure

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

Risk management measures

Use suitable eye protection.
PROC5 Mixing or blending in batch processes
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
Wear suitable gloves tested to EN374.

3. Exposure estimation (Environment 1)

Assessment method Used EUSES model.

Formulation & (re)packing of substances and mixtures, Industrial

Environmental exposure

Fresh water: Exposure 0.069 mg/l, PNEC 0.1 mg/l, RCR 0.69
freshwater sediment: Exposure 0.27 mg/kg, PNEC 0.386 mg/kg, RCR 0.69
Marine water: Exposure 0.007 mg/l, PNEC 0.01 mg/l, RCR 0.7
marine sediment: Exposure 0.027 mg/kg, PNEC 0.0386 mg/kg, RCR 0.7
Soil: Exposure 0.0038 mg/kg, PNEC 0.0185 mg/kg, RCR 0.21

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method

ECETOC TRA v2.0 Worker

Formulation & (re)packing of substances and mixtures, Industrial

Exposure

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

Worker - inhalation, long-term - systemic: Exposure 0.05 mg/m³, DNEL 263 mg/m³, RCR 0.0002

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

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

Worker - inhalation, long-term - systemic: Exposure 4.93 mg/m³, DNEL 263 mg/m³, RCR 0.02

Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

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

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

PROC4 Chemical production where opportunity for exposure arises

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

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

Worker - inhalation, long-term - systemic: Exposure 49.25 mg/m³, DNEL 263 mg/m³, RCR 0.19

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC15 Use as laboratory reagent.

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

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

Batch processes at elevated temperatures

Worker - inhalation, long-term - systemic: Exposure 123.13 mg/m³, DNEL 263 mg/m³, RCR 0.47

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC5 Mixing or blending in batch processes

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day,

Formulation & (re)packing of substances and mixtures, Industrial

RCR 0.03

PROC14 Tableting, compression, extrusion, pelletisation, granulation

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 3.43 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.04

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Industrial Use in Coatings (Water Based)

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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	Industrial Use in Coatings (Water Based)
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
SPERC	ESVOC SPERC 4.3a.v1

Worker

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 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. PROC15 Use as laboratory reagent.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Amounts used

Industrial Use in Coatings (Water Based)

Daily amount per site: 367 kg

Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 791 kg/day

Frequency and duration of use

Emission days: 300 days/year

Continuous release.

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Technical measures Store finished products in closed containers (e.g. bulk tanks, drums, cans). Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 87.4%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 87.4%

Conditions and measures related to external treatment of waste for disposal

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

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

Product characteristics

Physical state Liquid, vapour pressure < 0.5 kPa at STP

Concentration details Covers concentrations up to 25 %. Unless otherwise stated.

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

Temperature Assumes activities are at ambient temperature (unless stated differently).

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

Technical protective measures Avoid direct eye contact with product, also via contamination on hands.
PROC7 Industrial spraying Spraying (automatic/robotic) Carry out in a vented booth or extracted enclosure.

Organisational measures to prevent/limit releases, dispersion and exposure

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

Risk management measures

Industrial Use in Coatings (Water Based)

Use suitable eye protection.

PROC5 Mixing or blending in batch processes

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

PROC10 Roller application or brushing

PROC13 Treatment of articles by dipping and pouring.

Wear suitable gloves tested to EN374.

PROC7 Industrial spraying

Manual spraying

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

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

3. Exposure estimation (Environment 1)

Assessment method Used EUSES model.

Environmental exposure Fresh water: Exposure 0.046 mg/l, PNEC 0.1 mg/l, RCR 0.46
 freshwater sediment: Exposure 0.18 mg/kg, PNEC 0.386 mg/kg, RCR 0.46
 Marine water: Exposure 0.0046 mg/l, PNEC 0.01 mg/l, RCR 0.46
 marine sediment: Exposure 0.018 mg/kg, PNEC 0.0386 mg/kg, RCR 0.46
 Soil: Exposure 0.011 mg/kg, PNEC 0.0185 mg/kg, RCR 0.62

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker

Industrial Use in Coatings (Water Based)

Exposure

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

Worker - inhalation, long-term - systemic: Exposure 0.03 mg/m³, DNEL 263 mg/m³, RCR 0.0001

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

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

Worker - inhalation, long-term - systemic: Exposure 2.96 mg/m³, DNEL 263 mg/m³, RCR 0.01

Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

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

Film formation - force drying (50 - 100°C), stoving (> 100°C), UV/EB radiation curing

Worker - inhalation, long-term - systemic: Exposure 29.55 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

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

Worker - inhalation, long-term - systemic: Exposure 8.87 mg/m³, DNEL 263 mg/m³, RCR 0.03

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

PROC4 Chemical production where opportunity for exposure arises

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC5 Mixing or blending in batch processes

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC7 Industrial spraying

Spraying (automatic/robotic)

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 2.14 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC7 Industrial spraying

Manual spraying

Worker - inhalation, long-term - systemic: Exposure 29.55 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 4.29 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.05

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

Worker - inhalation, long-term - systemic: Exposure 29.55 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day,

Industrial Use in Coatings (Water Based)

RCR 0.08

PROC13 Treatment of articles by dipping and pouring.

Worker - inhalation, long-term - systemic: Exposure 29.55 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC15 Use as laboratory reagent.

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Professional Use in Coatings (Water Based)

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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	Professional Use in Coatings (Water Based)
Main sector	SU22 Professional uses

Environment

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)
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SPERC	ESVOC SPERC 8.3b.v1
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Worker

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 PROC10 Roller application or brushing PROC11 Non industrial spraying PROC13 Treatment of articles by dipping and pouring. PROC15 Use as laboratory reagent. PROC19 Manual activities involving hand contact
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Professional Use in Coatings (Water Based)

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

Amounts used

Daily amount per site: 0.063 kg
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 69 kg/day

Frequency and duration of use

Emission days: 300 days/year
Continuous release.

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Technical measures Store finished products in closed containers (e.g. bulk tanks, drums, cans). Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 87.4%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 87.4%

Conditions and measures related to external treatment of waste for disposal

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

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

Product characteristics

Physical state Liquid, vapour pressure < 0.5 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).

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes activities are at ambient temperature (unless stated differently).

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

Technical protective measures Avoid direct eye contact with product, also via contamination on hands.
PROC11 Non industrial spraying Indoor. Carry out in a vented booth or extracted enclosure.
PROC19 Manual activities involving hand contact 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.
PROC19 Manual activities involving hand contact Avoid carrying out operation for more than 4 hours.

Risk management measures

Professional Use in Coatings (Water Based)

Use suitable eye protection.

PROC5 Mixing or blending in batch processes

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

PROC13 Treatment of articles by dipping and pouring.

Wear suitable gloves tested to EN374.

PROC10 Roller application or brushing

PROC19 Manual activities involving hand contact

Wear chemically-resistant gloves (tested to EN374) in combination with specific activity training.

PROC11 Non industrial spraying

Outdoor.

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

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

PROC11 Non industrial spraying

Indoor.

Wear chemically-resistant gloves (tested to EN374) in combination with specific activity training.

3. Exposure estimation (Environment 1)

Assessment method	Used EUSES model.
Environmental exposure	Fresh water: Exposure 0.000134 mg/l, PNEC 0.1 mg/l, RCR 0.0013 freshwater sediment: Exposure 0.00048 mg/kg, PNEC 0.386 mg/kg, RCR 0.0013 Marine water: Exposure 0.000017 mg/l, PNEC 0.01 mg/l, RCR 0.0017 marine sediment: Exposure 0.000066 mg/kg, PNEC 0.0386 mg/kg, RCR 0.0017 Soil: Exposure 0.000065 mg/kg, PNEC 0.0185 mg/kg, RCR 0.0035

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method	ECETOC TRA v2.0 Worker
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Professional Use in Coatings (Water Based)

Exposure

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

Worker - inhalation, long-term - systemic: Exposure 0.05 mg/m³, DNEL 263 mg/m³, RCR 0.0002

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

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

Worker - inhalation, long-term - systemic: Exposure 24.63 mg/m³, DNEL 263 mg/m³, RCR 0.09

Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

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

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

PROC4 Chemical production where opportunity for exposure arises

Worker - inhalation, long-term - systemic: Exposure 49.25 mg/m³, DNEL 263 mg/m³, RCR 0.19

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC5 Mixing or blending in batch processes

Worker - inhalation, long-term - systemic: Exposure 49.25 mg/m³, DNEL 263 mg/m³, RCR 0.19

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

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

Worker - inhalation, long-term - systemic: Exposure 123.13 mg/m³, DNEL 263 mg/m³, RCR 0.47

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Worker - inhalation, long-term - systemic: Exposure 49.25 mg/m³, DNEL 263 mg/m³, RCR 0.19

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC10 Roller application or brushing

Worker - inhalation, long-term - systemic: Exposure 123.13 mg/m³, DNEL 263 mg/m³, RCR 0.47

Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

PROC11 Non industrial spraying

Outdoor.

Worker - inhalation, long-term - systemic: Exposure 49.25 mg/m³, DNEL 263 mg/m³, RCR 0.19

Worker - dermal, long-term - systemic: Exposure 5.36 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.06

PROC11 Non industrial spraying

Indoor.

Worker - inhalation, long-term - systemic: Exposure 98.5 mg/m³, DNEL 263 mg/m³, RCR 0.37

Worker - dermal, long-term - systemic: Exposure 0.11 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.001

Professional Use in Coatings (Water Based)

PROC13 Treatment of articles by dipping and pouring.

Worker - inhalation, long-term - systemic: Exposure 49.25 mg/m³, DNEL 263 mg/m³, RCR 0.19

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC15 Use as laboratory reagent.

Worker - inhalation, long-term - systemic: Exposure 49.25 mg/m³, DNEL 263 mg/m³, RCR 0.19

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

PROC19 Manual activities involving hand contact

Worker - inhalation, long-term - systemic: Exposure 44.33 mg/m³, DNEL 263 mg/m³, RCR 0.17

Worker - dermal, long-term - systemic: Exposure 7.07 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.09

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Use in Coatings, Consumer

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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 in Coatings, Consumer
Product category	PC1 Adhesives, sealants. PC9a Coatings and paints, thinners, paint removers.
Main sector	SU21 Consumer uses

Environment

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 8.3c.v1

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

Frequency and duration of use

Emission days: 365 days/year

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
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Risk management measures

STP type	Municipal STP.
STP details	Estimated substance removal from wastewater via domestic sewage treatment: 87.4%

Conditions and measures related to external treatment of waste for disposal

Use in Coatings, Consumer

Disposal method Dispose of waste product or used containers according to local regulations

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

Product characteristics

Concentration details Concentration of substance in product: 5%

Amounts used

PC1 Adhesives, sealants.
Amount per use: 100 g
PC9a Coatings and paints, thinners, paint removers.
Amount per use: 1250 g

Frequency and duration of use

Covers daily exposure up to 2hours

Other given operational conditions affecting Non-industrial exposure

Room size Avoid using in room size less than 10 m³.

Ventilation rate Ensure doors and windows are opened.

3. Exposure estimation (Environment 1)

Assessment method Used EUSES model.

Environmental exposure Fresh water: Exposure 0.00012 mg/l, PNEC 0.1 mg/l, RCR 0.0012
freshwater sediment: Exposure 0.00047 mg/kg, PNEC 0.386 mg/kg, RCR 0.0012
Marine water: Exposure 0.000017 mg/l, PNEC 0.01 mg/l, RCR 0.0017
marine sediment: Exposure 0.000065 mg/kg, PNEC 0.0386 mg/kg, RCR 0.0017
Soil: Exposure 0.000065 mg/kg, PNEC 0.0185 mg/kg, RCR 0.0035

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method The ECETOC TRA tool has been used to estimate consumer exposures, unless otherwise indicated.

Exposure PC9a Coatings and paints, thinners, paint removers.
Consumer - inhalation, long-term - systemic: Exposure 15.1 mg/m³, DNEL 38 mg/m³, RCR 0.40
Consumer - dermal, long-term - systemic: Exposure 0.424 mg/kg/day, DNEL 36 mg/kg/day, RCR 0.01
PC1 Adhesives, sealants.
Consumer - dermal, long-term - systemic: Exposure 0.417 mg/kg/day, DNEL 36 mg/kg/day, RCR 0.01
Consumer - inhalation, long-term - systemic: Exposure 7.8 mg/m³, DNEL 38 mg/m³, RCR 0.21

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.



Exposure scenario

Use in Cleaning Agents, Professional

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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 in Cleaning Agents, Professional
Main sector	SU22 Professional uses

Environment

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)
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SPERC	ESVOC SPERC 8.4b.v1
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Worker

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 (Industrial - Environment 1)

Amounts used

Use in Cleaning Agents, Professional

Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 74 kg/day

Frequency and duration of use

Emission days: 365 days/year
Continuous release.

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

STP details Estimated substance removal from wastewater via domestic sewage treatment: 87.4%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 87.4%

Conditions and measures related to external treatment of waste for disposal

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

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

Product characteristics

Physical state Liquid, vapour pressure < 0.5 kPa at STP
Concentration details Covers concentrations up to 25 %. Unless otherwise stated.

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.
Temperature Assumes activities are at ambient temperature (unless stated differently).

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

Technical protective measures Avoid direct eye contact with product, also via contamination on hands.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented.
PROC11 Non industrial spraying Avoid carrying out operation for more than 4 hours.

Risk management measures

Use suitable eye protection.
PROC4 Chemical production where opportunity for exposure arises
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC10 Roller application or brushing
PROC13 Treatment of articles by dipping and pouring.
Wear suitable gloves tested to EN374.
PROC11 Non industrial spraying
Wear chemically-resistant gloves (tested to EN374) in combination with specific activity training.

3. Exposure estimation (Environment 1)

Use in Cleaning Agents, Professional

Assessment method	Used EUSES model.
Environmental exposure	Fresh water: Exposure 0.00124 mg/l, PNEC 0.1 mg/l, RCR 0.0012 freshwater sediment: Exposure 0.00047 mg/kg, PNEC 0.386 mg/kg, RCR 0.0012 Marine water: Exposure 0.000017 mg/l, PNEC 0.01 mg/l, RCR 0.0017 marine sediment: Exposure 0.000064 mg/kg, PNEC 0.0386 mg/kg, RCR 0.0017 Soil: Exposure 0.000065 mg/kg, PNEC 0.0185 mg/kg, RCR 0.0035

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method	ECETOC TRA v2.0 Worker
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Use in Cleaning Agents, Professional

Exposure

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

Worker - inhalation, long-term - systemic: Exposure 0.03 mg/m³, DNEL 263 mg/m³, RCR 0.0001

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

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

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

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

Worker - inhalation, long-term - systemic: Exposure 8.87 mg/m³, DNEL 263 mg/m³, RCR 0.03

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

PROC4 Chemical production where opportunity for exposure arises

Worker - inhalation, long-term - systemic: Exposure 29.55 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Worker - inhalation, long-term - systemic: Exposure 29.55 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

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

Worker - inhalation, long-term - systemic: Exposure 73.88 mg/m³, DNEL 263 mg/m³, RCR 0.28

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC13 Treatment of articles by dipping and pouring.

Worker - inhalation, long-term - systemic: Exposure 29.55 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC10 Roller application or brushing

Worker - inhalation, long-term - systemic: Exposure 73.88 mg/m³, DNEL 263 mg/m³, RCR 0.28

Worker - dermal, long-term - systemic: Exposure 5.49 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.07

PROC11 Non industrial spraying

Worker - inhalation, long-term - systemic: Exposure 59.1 mg/m³, DNEL 263 mg/m³, RCR 0.22

Worker - dermal, long-term - systemic: Exposure 5.36 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.06

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Use in Cleaning Agents, Consumer

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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 in Cleaning Agents, Consumer
Product category	PC35 Washing and cleaning products
Main sector	SU21 Consumer uses

Environment

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 8.4c.v1

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

Frequency and duration of use

Emission days: 365 days/year

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
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Risk management measures

STP type	Municipal STP.
STP details	Estimated substance removal from wastewater via domestic sewage treatment: 87.4%

Conditions and measures related to external treatment of waste for disposal

Disposal method	Dispose of waste product or used containers according to local regulations
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Use in Cleaning Agents, Consumer

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

Product characteristics

Concentration details Concentration of substance in product: 5%

Amounts used

Amount per use: 16 g

Frequency and duration of use

Covers daily exposure up to 2hours

Other given operational conditions affecting Non-industrial exposure

No specific risk management measure identified beyond those operational conditions stated.

3. Exposure estimation (Environment 1)

Assessment method Used EUSES model.

Environmental exposure Fresh water: Exposure 0.00012 mg/l, PNEC 0.1 mg/l, RCR 0.0012
freshwater sediment: Exposure 0.00048 mg/kg, PNEC 0.386 mg/kg, RCR 0.0012
Marine water: Exposure 0.000017 mg/l, PNEC 0.01 mg/l, RCR 0.0017
marine sediment: Exposure 0.000065 mg/kg, PNEC 0.0386 mg/kg, RCR 0.0017
Soil: Exposure 0.000065 mg/kg, PNEC 0.0185 mg/kg, RCR 0.0035

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method The ECETOC TRA tool has been used to estimate consumer exposures, unless otherwise indicated.

Exposure Consumer - inhalation, long-term - systemic: Exposure 0.45 mg/m³, DNEL 38 mg/m³, RCR 0.01
Consumer - dermal, long-term - systemic: Exposure 0.15 mg/kg/day, DNEL 36 mg/kg/day, RCR 0.004

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.



Exposure scenario Lubricants, Professional

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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	Lubricants, Professional
Main sector	SU22 Professional uses

Environment

Environmental release category	ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
SPERC	ESVOC SPERC 9.6b.v1

Worker

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 PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC10 Roller application or brushing PROC11 Non industrial spraying PROC13 Treatment of articles by dipping and pouring. PROC17 Lubrication at high energy conditions in metal working operations PROC18 General greasing/lubrication at high kinetic energy conditions PROC20 Use of functional fluids in small devices
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Lubricants, Professional

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

Amounts used

Daily amount per site: 0.00014 kg

Frequency and duration of use

Emission days: 300 days/year
Continuous release.

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

STP details Estimated substance removal from wastewater via domestic sewage treatment: 87.4%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant)
RMMs: 87.4%

Conditions and measures related to external treatment of waste for disposal

Waste treatment Incinerate, absorb or adsorb vapours stripped from solution whenever necessary. Dispose of waste product or used containers in accordance with local regulations

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

Product characteristics

Physical state Liquid, vapour pressure < 0.5 kPa at STP

Concentration details Covers concentrations up to 25 %. Unless otherwise stated.

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes activities are at ambient temperature (unless stated differently).

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

Technical protective measures Avoid direct eye contact with product, also via contamination on hands.
PROC11 Non industrial spraying Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
PROC17 Lubrication at high energy conditions in metal working operations Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. , or: Ensure operation is undertaken outdoors.
PROC18 General greasing/lubrication at high kinetic energy conditions 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.
PROC11 Non industrial spraying Avoid carrying out operation for more than 1 hour.

Risk management measures

Lubricants, Professional

Use suitable eye protection.

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

PROC10 Roller application or brushing

PROC13 Treatment of articles by dipping and pouring.

PROC18 General greasing/lubrication at high kinetic energy conditions

Wear suitable gloves tested to EN374.

Wear chemically-resistant gloves (tested to EN374) in combination with specific activity training.

PROC17 Lubrication at high energy conditions in metal working operations

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

PROC11 Non industrial spraying

Wear chemically-resistant gloves (tested to EN374) in combination with specific activity training.

3. Exposure estimation (Environment 1)

Assessment method Used EUSES model.

Environmental exposure Fresh water: Exposure 0.00012 mg/l, PNEC 0.1 mg/l, RCR 0.0012
 freshwater sediment: Exposure 0.00047 mg/kg, PNEC 0.386 mg/kg, RCR 0.0012
 Marine water: Exposure 0.000017 mg/l, PNEC 0.01 mg/l, RCR 0.0017
 marine sediment: Exposure 0.000064 mg/kg, PNEC 0.0386 mg/kg, RCR 0.0017
 Soil: Exposure 0.000065 mg/kg, PNEC 0.0185 mg/kg, RCR 0.0035

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker

Lubricants, Professional

Exposure

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

Worker - inhalation, long-term - systemic: Exposure 0.03 mg/m³, DNEL 263 mg/m³, RCR 0.0001

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

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

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

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

Worker - inhalation, long-term - systemic: Exposure 8.87 mg/m³, DNEL 263 mg/m³, RCR 0.03

Worker - dermal, long-term - systemic: Exposure 0.34 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.004

PROC4 Chemical production where opportunity for exposure arises

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

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

Worker - inhalation, long-term - systemic: Exposure 73.88 mg/m³, DNEL 263 mg/m³, RCR 0.28

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
Elevated temperature

Worker - inhalation, long-term - systemic: Exposure 124.11 mg/m³, DNEL 263 mg/m³, RCR 0.47

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Worker - inhalation, long-term - systemic: Exposure 29.55 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
Elevated temperature

Worker - inhalation, long-term - systemic: Exposure 147.75 mg/m³, DNEL 263 mg/m³, RCR 0.56

Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 6.86 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC10 Roller application or brushing

Worker - inhalation, long-term - systemic: Exposure 73.88 mg/m³, DNEL 263 mg/m³, RCR 0.28

Lubricants, Professional

Worker - dermal, long-term - systemic: Exposure 5.49 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.07

PROC11 Non industrial spraying

Worker - inhalation, long-term - systemic: Exposure 41.37 mg/m³, DNEL 263 mg/m³, RCR 0.16

Worker - dermal, long-term - systemic: Exposure 5.36 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.06

PROC13 Treatment of articles by dipping and pouring.

Worker - inhalation, long-term - systemic: Exposure 29.55 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC17 Lubrication at high energy conditions in metal working operations

Indoor.

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 1.37 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

PROC17 Lubrication at high energy conditions in metal working operations

Outdoor.

Worker - inhalation, long-term - systemic: Exposure 103.43 mg/m³, DNEL 263 mg/m³, RCR 0.39

Worker - dermal, long-term - systemic: Exposure 21.00 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.08

PROC18 General greasing/lubrication at high kinetic energy conditions

Worker - inhalation, long-term - systemic: Exposure 103.43 mg/m³, DNEL 263 mg/m³, RCR 0.39

Worker - dermal, long-term - systemic: Exposure 2.74 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.03

PROC20 Use of functional fluids in small devices

Worker - inhalation, long-term - systemic: Exposure 14.78 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 1.71 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.02

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Use in Cleaning Agents, Industrial

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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 in Cleaning Agents, Industrial
Main sector	SU3 Industrial uses

Environment

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

Worker

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 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)

Amounts used

Daily amount per site: 5000 kg

Use in Cleaning Agents, Industrial

Frequency and duration of use

Emission days: 20 days/year
Continuous release.

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 87.4%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant)
RMMs: 87.4%

Conditions and measures related to external treatment of waste for disposal

Disposal method Dispose of waste product or used containers according to local regulations

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

Product characteristics

Physical state Liquid, vapour pressure < 0.5 kPa at STP

Concentration details Covers concentrations up to 20 %. Unless otherwise stated.

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

Setting Indoor/outdoor use.

Temperature Assumes activities are at ambient temperature (unless stated differently).

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

Technical protective measures Avoid direct eye contact with product, also via contamination on hands.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Assumes a good basic standard of occupational hygiene is implemented.
PROC10 Roller application or brushing Cleaning with low-pressure washers Avoid carrying out operation for more than 4 hours.

Risk management measures

Use suitable eye protection.
PROC7 Industrial spraying
Wear a respirator conforming to EN140 with Type A filter or better.

3. Exposure estimation (Environment 1)

Assessment method Used EUSES model.

Environmental exposure Fresh water: Exposure 0.0033 mg/l, PNEC 0.1 mg/l, RCR 0.033
freshwater sediment: Exposure 0.013 mg/kg, PNEC 0.386 mg/kg, RCR 0.033
Marine water: Exposure 0.00033 mg/l, PNEC 0.01 mg/l, RCR 0.033
marine sediment: Exposure 0.0013 mg/kg, PNEC 0.0386 mg/kg, RCR 0.033
Soil: Exposure 0.0028 mg/kg, PNEC 0.0185 mg/kg, RCR 0.15

Use in Cleaning Agents, Industrial

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method	ECETOC TRA v2.0 Worker
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Use in Cleaning Agents, Industrial

Exposure

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

Worker - inhalation, long-term - systemic: Exposure 0.03 mg/m³, DNEL 263 mg/m³, RCR 0.0001

Worker - dermal, long-term - systemic: Exposure 0.02 mg/kg/day, DNEL 82.5 mg/kg/day, RCR <0.01

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

Worker - inhalation, long-term - systemic: Exposure 2.95 mg/m³, DNEL 263 mg/m³, RCR 0.01

Worker - dermal, long-term - systemic: Exposure 0.82 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.01

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

Worker - inhalation, long-term - systemic: Exposure 8.86 mg/m³, DNEL 263 mg/m³, RCR 0.03

Worker - dermal, long-term - systemic: Exposure 0.41 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.01

PROC4 Chemical production where opportunity for exposure arises

Elevated temperature

Worker - inhalation, long-term - systemic: Exposure 59.09 mg/m³, DNEL 263 mg/m³, RCR 0.22

Worker - dermal, long-term - systemic: Exposure 4.12 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.05

PROC4 Chemical production where opportunity for exposure arises

Worker - inhalation, long-term - systemic: Exposure 14.77 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 4.12 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.05

PROC7 Industrial spraying

Worker - inhalation, long-term - systemic: Exposure 29.54 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 25.72 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.31

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

Worker - inhalation, long-term - systemic: Exposure 29.54 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 8.23 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.10

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

Worker - inhalation, long-term - systemic: Exposure 14.77 mg/m³, DNEL 263 mg/m³, RCR 0.06

Worker - dermal, long-term - systemic: Exposure 8.23 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.10

PROC10 Roller application or brushing

Surface cleaning

Worker - inhalation, long-term - systemic: Exposure 29.54 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 16.46 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.20

PROC10 Roller application or brushing

Cleaning with low-pressure washers

Worker - inhalation, long-term - systemic: Exposure 17.73 mg/m³, DNEL 263 mg/m³, RCR 0.07

Worker - dermal, long-term - systemic: Exposure 16.46 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.20

Use in Cleaning Agents, Industrial

PROC13 Treatment of articles by dipping and pouring.

Worker - inhalation, long-term - systemic: Exposure 29.54 mg/m³, DNEL 263 mg/m³, RCR 0.11

Worker - dermal, long-term - systemic: Exposure 8.23 mg/kg/day, DNEL 82.5 mg/kg/day, RCR 0.10

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario Use in Cosmetics, Consumer

Identification

Product name	1-Propoxy-2-propanol
REACH registration number	01-2119474443-37-XXXX
CAS number	1569-01-3
EC number	216-372-4
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 in Cosmetics, Consumer
Product category	PC39 Cosmetics, personal care.
Main sector	SU21 Consumer uses

Environment

Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
SPERC	ESVOC SPERC 8.16.v1

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

Amounts used

Daily amount per site: 0.0015 kg

Frequency and duration of use

Emission days: 300 days/year

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
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Risk management measures

STP type	Municipal STP.
STP details	Estimated substance removal from wastewater via domestic sewage treatment: 87.4%

Conditions and measures related to external treatment of waste for disposal

Use in Cosmetics, Consumer

Disposal method Dispose of waste product or used containers according to local regulations

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

Control of Non-industrial exposure

In accordance to the Article 14 (5b) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation for human health does not need to be performed for end uses in cosmetic products within the scope of Directive 76/768/EEC.

3. Exposure estimation (Environment 1)

Assessment method Used EUSES model.

Environmental exposure Fresh water: Exposure 0.00012 mg/l, PNEC 0.1 mg/l, RCR 0.0012
freshwater sediment: Exposure 0.00047 mg/kg, PNEC 0.386 mg/kg, RCR 0.0012
Marine water: Exposure 0.000017 mg/l, PNEC 0.01 mg/l, RCR 0.0017
marine sediment: Exposure 0.000065 mg/kg, PNEC 0.0386 mg/kg, RCR 0.0017
Soil: Exposure 0.000065 mg/kg, PNEC 0.0185 mg/kg, RCR 0.0035

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).