



SAFETY DATA SHEET BRINEGUARD SOLUTION

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

1.1. Product identifier

Product name	BRINEGUARD SOLUTION
Product number	10853
Synonyms; trade names	BRINEGUARD 20, BRINEGUARD 25, BRINEGUARD 29, BRINEGUARD 36

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

Identified uses	Coolant
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1.3. Söluaðili Olíuverzlun Íslands hf.

Skútuvogur 5
104 Reykjavík
Sími: 515 1000
Netfang: olis@olis.is
Veffang: www.olis.is

1.4. Neyðarsímanúmer

Neyðarlínan: 112
Eitrunarmiðstöð LSH: 543 2222

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards	Not Classified
Health hazards	Eye Irrit. 2 - H319
Environmental hazards	Not Classified

2.2. Label elements

Pictogram



Signal word	Warning
Hazard statements	H319 Causes serious eye irritation.

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Precautionary statements

P264 Wash contaminated skin thoroughly after handling.
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P337+P313 If eye irritation persists: Get medical advice/ attention.

2.3. Other hazards

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

SECTION 3: Composition/information on ingredients

3.2. Mixtures

CALCIUM CHLORIDE	20-40
CAS number: 10043-52-4	EC number: 233-140-8
	REACH registration number: 01-2119494219-28-XXXX
Classification	
Eye Irrit. 2 - H319	
MORPHOLINE	<0.1%
CAS number: 110-91-8	EC number: 203-815-1
	REACH registration number: 01-2119496057-30-XXXX
Classification	
Flam. Liq. 3 - H226	
Acute Tox. 4 - H302	
Acute Tox. 3 - H311	
Acute Tox. 3 - H331	
Skin Corr. 1B - H314	
Eye Dam. 1 - H318	
HEXANOIC ACID, 6,6',6''-(1,3,5-TRIAZINE-2,4,6-TRIYLTRIIMINO)TRIS-, TRIPOTASSIUM SALT	<0.1%
CAS number: 135043-69-5	EC number: 700-335-9
Classification	
Skin Irrit. 2 - H315	
Eye Irrit. 2 - H319	
POTASSIUM HYDROXIDE	<0.1%
CAS number: 1310-58-3	EC number: 215-181-3
	REACH registration number: 01-2119487136-33-XXXX
Classification	
Met. Corr. 1 - H290	
Acute Tox. 4 - H302	
Skin Corr. 1A - H314	
Eye Dam. 1 - H318	

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TRIPOTASSIUM[CARBOXY(OXIDO)METHYL]PHOSPHONATE

<0.1%

CAS number: 129836-13-1

EC number: 700-033-7

Classification

Acute Tox. 4 - H302

Skin Corr. 1 - H314

Eye Dam. 1 - H318

Skin Sens. 1 - H317

STOT RE 2 - H373

Aquatic Chronic 3 - H412

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

Composition comments The data shown are in accordance with the latest EC Directives.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing.
Ingestion	Rinse mouth thoroughly with water. Give plenty of water to drink.
Skin contact	Remove contaminated clothing and rinse skin thoroughly with water.
Eye contact	Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

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

Eye contact Irritating to eyes.

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

Notes for the doctor No specific recommendations. Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Use fire-extinguishing media suitable for the surrounding fire. The product is non-combustible.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards Oxides of carbon.

5.3. Advice for firefighters

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 Avoid contact with skin and eyes. Provide adequate ventilation.

6.2. Environmental precautions

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Environmental precautions Avoid discharge into drains or watercourses or onto the ground. Contain spillage with sand, earth or other suitable non-combustible material.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Contain spillage with sand, earth or other suitable non-combustible material. Rinse with water.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Provide adequate ventilation. Avoid spilling. The following protection should be worn: Chemical splash goggles or face shield. Provide eyewash station. Avoid contact with skin and eyes.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container.

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

MORPHOLINE

Sk

Long-term exposure limit (8-hour TWA): WEL 10 ppm 36 mg/m³

Short-term exposure limit (15-minute): WEL 20 ppm 72 mg/m³

POTASSIUM HYDROXIDE

Short-term exposure limit (15-minute): WEL 2 mg/m³

Sk = Can be absorbed through the skin.

WEL = Workplace Exposure Limit

CALCIUM CHLORIDE (CAS: 10043-52-4)

DNEL	Industry - Inhalation; Long term : 5 mg/m ³
	Industry - Inhalation; Short term : 10 mg/m ³
	Consumer - Inhalation; Long term : 2.5 mg/m ³
	Consumer - Inhalation; Short term : 5 mg/m ³

MORPHOLINE (CAS: 110-91-8)

Ingredient comments WEL = Workplace Exposure Limits

DNEL	Industry - Inhalation; Long term local effects: 36 mg/m ³
	Industry - Dermal; Long term systemic effects: 1.04 mg/kg/day
	Industry - Inhalation; Long term systemic effects: 91 mg/m ³
	Consumer - Oral; Long term systemic effects: 6.3 mg/kg/day
	Consumer - Inhalation; Long term local effects: 3.2 mg/m ³
	Consumer - Dermal; Long term systemic effects: 0.52 mg/kg/day
	Consumer - Inhalation; Long term systemic effects: 45 mg/m ³
Consumer - Inhalation; Short term local effects: 18 mg/m ³	

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PNEC	- Fresh water; 0.1 mg/l
	- Marine water; 0.01 mg/l
	- Sediment; 1.49 mg/kg
	- Soil; 0.239 mg/kg
	- STP; 10 mg/l
	- Intermittent release; 0.28 mg/l
	- Sediment (Marinewater); 0.149 mg/kg

POTASSIUM HYDROXIDE (CAS: 1310-58-3)

Ingredient comments	WEL = Workplace Exposure Limits
DNEL	Industry - Inhalation; Long term local effects: 1 mg/m ³ Consumer - Inhalation; Long term local effects: 1 mg/m ³

8.2. Exposure controls

Protective equipment



Eye/face protection	The following protection should be worn: Chemical splash goggles or face shield. EN 166
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. Rubber (natural, latex). Neoprene. Polyvinyl chloride (PVC). EN 374
Other skin and body protection	Wear protective clothing.
Respiratory protection	If ventilation is inadequate, suitable respiratory protection must be worn. EN 136/140/141/145/143/149

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Colourless to pale yellow.
Odour	No characteristic odour.
Odour threshold	No information available.
pH	pH (diluted solution): 8,7 - 9,4 @ 25%-ig
Melting point	-29°C
Initial boiling point and range	100°C @
Flash point	No information available.
Evaporation rate	No information available.
Evaporation factor	No information available.
Flammability (solid, gas)	No information available.
Upper/lower flammability or explosive limits	No information available.
Other flammability	No information available.

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Vapour pressure	No information available.
Vapour density	No information available.
Relative density	No information available.
Bulk density	1230 kg/m ³
Solubility(ies)	Completely soluble in water.
Partition coefficient	No information available.
Auto-ignition temperature	No information available.
Decomposition Temperature	No information available.
Viscosity	No information available.
Explosive properties	No information available.
Explosive under the influence of a flame	No information available.
Oxidising properties	No information available.

9.2. Other information

Other information	Not determined.
Refractive index	No information available.
Particle size	No information available.
Molecular weight	No information available.
Volatility	No information available.
Saturation concentration	No information available.
Critical temperature	No information available.
Volatile organic compound	No information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	Not determined.
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10.2. Chemical stability

Stability	Stable under the prescribed storage conditions.
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10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Not determined.
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10.4. Conditions to avoid

Conditions to avoid	There are no known conditions that are likely to result in a hazardous situation.
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10.5. Incompatible materials

Materials to avoid	Not determined.
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10.6. Hazardous decomposition products

Hazardous decomposition products	Oxides of carbon.
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SECTION 11: Toxicological information

11.1. Information on toxicological effects

Skin corrosion/irritation

Skin corrosion/irritation No information available.

Serious eye damage/irritation

Serious eye damage/irritation No information available.

Respiratory sensitisation

Respiratory sensitisation No information available.

Skin sensitisation

Skin sensitisation No information available.

Germ cell mutagenicity

Genotoxicity - in vitro No information available.

Carcinogenicity

Carcinogenicity No information available.

Reproductive toxicity

Reproductive toxicity - fertility No information available.

Specific target organ toxicity - single exposure

STOT - single exposure No information available.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure No information available.

Aspiration hazard

Aspiration hazard No information available.

Inhalation

Spray/mists may cause respiratory tract irritation.

Ingestion

Liquid irritates mucous membranes and may cause abdominal pain if swallowed. Nausea, vomiting.

Skin contact

Prolonged and frequent contact may cause redness and irritation.

Eye contact

Vapour or spray in the eyes may cause irritation and smarting.

Toxicological information on ingredients.

CALCIUM CHLORIDE

Acute toxicity - oral

Notes (oral LD₅₀) LD₅₀ 2301 mg/kg, Oral, Rat

Acute toxicity - dermal

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

Acute toxicity - inhalation

Notes (inhalation LC₅₀) No specific test data are available.

Skin corrosion/irritation

Skin corrosion/irritation Not irritating. Rabbit OECD 404

Serious eye damage/irritation

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Serious eye damage/irritation	Causes serious eye irritation. Rabbit OECD 405
<u>Respiratory sensitisation</u>	
Respiratory sensitisation	Based on available data the classification criteria are not met.
<u>Skin sensitisation</u>	
Skin sensitisation	Based on available data the classification criteria are not met.
<u>Germ cell mutagenicity</u>	
Genotoxicity - in vitro	Bacterial reverse mutation test: Negative. Chromosome aberration: Negative.
Genotoxicity - in vivo	Does not contain any substances known to be mutagenic.
<u>Carcinogenicity</u>	
Carcinogenicity	Based on available data the classification criteria are not met.
<u>Reproductive toxicity</u>	
Reproductive toxicity - fertility	No evidence of reproductive toxicity in animal studies.
Reproductive toxicity - development	No evidence of reproductive toxicity in animal studies.
<u>Specific target organ toxicity - single exposure</u>	
STOT - single exposure	Based on available data the classification criteria are not met.
<u>Specific target organ toxicity - repeated exposure</u>	
STOT - repeated exposure	Based on available data the classification criteria are not met.
<u>Aspiration hazard</u>	
Aspiration hazard	Not anticipated to present an aspiration hazard, based on chemical structure.
Inhalation	Dust in high concentrations may irritate the respiratory system.
Ingestion	May cause discomfort if swallowed.
Skin contact	Prolonged skin contact may cause temporary irritation.
Eye contact	Causes serious eye irritation. May cause permanent damage if eye is not immediately irrigated.

MORPHOLINE

<u>Acute toxicity - oral</u>	
Acute toxicity oral (LD₅₀ mg/kg)	1,910.0
Species	Rat
ATE oral (mg/kg)	1,910.0
<u>Acute toxicity - dermal</u>	
Acute toxicity dermal (LD₅₀ mg/kg)	500.0
Species	Rabbit

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ATE dermal (mg/kg) 500.0

Acute toxicity - inhalation

Acute toxicity inhalation (LC₅₀ vapours mg/l) 8.0

Species Rat

ATE inhalation (vapours mg/l) 8.0

Skin corrosion/irritation

Animal data Highly corrosive.

Serious eye damage/irritation

Serious eye damage/irritation Risk of serious damage to eyes.

Germ cell mutagenicity

Genotoxicity - in vitro This substance has no evidence of mutagenic properties.

Carcinogenicity

Carcinogenicity There is no evidence that the product can cause cancer.

IARC carcinogenicity IARC Group 3 Not classifiable as to its carcinogenicity to humans.

Reproductive toxicity

Reproductive toxicity - fertility Data lacking.

Inhalation Gas or vapour in high concentrations may irritate the respiratory system. Symptoms following overexposure may include the following: Headache. Fatigue. Nausea, vomiting. Harmful by inhalation.

Ingestion Harmful if swallowed. Liquid irritates mucous membranes and may cause abdominal pain if swallowed. May cause nausea, headache, dizziness and intoxication. Causes burns.

Skin contact Toxic in contact with skin. Causes burns. Product has a defatting effect on skin.

Eye contact A single exposure may cause the following adverse effects: Corneal damage. Causes burns.

POTASSIUM HYDROXIDE

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg) 333.0

Species Rat

ATE oral (mg/kg) 333.0

Skin corrosion/irritation

Animal data Corrosive.

Serious eye damage/irritation

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Serious eye damage/irritation	Causes serious eye damage.
<u>Respiratory sensitisation</u>	
Respiratory sensitisation	No information available.
<u>Skin sensitisation</u>	
Skin sensitisation	Not sensitising.
<u>Germ cell mutagenicity</u>	
Genotoxicity - in vitro	Ames test: Negative. This substance has no evidence of mutagenic properties.
<u>Carcinogenicity</u>	
Carcinogenicity	No information available.
<u>Reproductive toxicity</u>	
Reproductive toxicity - fertility	No information available.
<u>Specific target organ toxicity - single exposure</u>	
STOT - single exposure	No information available.
<u>Specific target organ toxicity - repeated exposure</u>	
STOT - repeated exposure	No information available.
<u>Aspiration hazard</u>	
Aspiration hazard	No information available.
.	
Inhalation	Dust may irritate respiratory system or lungs.
Ingestion	Harmful if swallowed. May cause chemical burns in mouth, oesophagus and stomach.
Skin contact	Causes severe burns.
Eye contact	May cause serious eye damage.

TRIPOTASSIUM[CARBOXY(OXIDO)METHYL]PHOSPHONATE

<u>Acute toxicity - oral</u>	
Acute toxicity oral (LD₅₀ mg/kg)	1,260.0
Species	Rat
ATE oral (mg/kg)	1,260.0

SECTION 12: Ecological Information

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

Ecological information on ingredients.

CALCIUM CHLORIDE

BRINEGUARD SOLUTION

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

MORPHOLINE

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

POTASSIUM HYDROXIDE

Ecotoxicity The product may affect the acidity (pH) of water which may have hazardous effects on aquatic organisms.

12.1. Toxicity

Toxicity Not considered toxic to fish.

Ecological information on ingredients.

CALCIUM CHLORIDE

Acute aquatic toxicity

Acute toxicity - fish LC₅₀, 96 hours: 13 400 mg/l, Fish
LC₅₀, 96 hour: 4630 mg/l, Pimephales promelas (Fat-head Minnow)
LC₅₀, 48 hour: > 6560 mg/l, Pimephales promelas (Fat-head Minnow)
LC₅₀, 24 hour: > 6660 mg/l, Pimephales promelas (Fat-head Minnow)

Acute toxicity - aquatic invertebrates LC₅₀, 48 hour: 2400 mg/l, Daphnia magna
OECD 202

Acute toxicity - aquatic plants EyC₅₀, 72 hour: 2900 mg/l, Selenastrum capricornutum
OECD 201
ErC₅₀, 72 hour: > 4000 mg/l, Selenastrum capricornutum
OECD 201
EC₂₀, 72 hour: 1000 mg/l, Selenastrum capricornutum
OECD 201

Chronic aquatic toxicity

Chronic toxicity - aquatic invertebrates EC₅₀, 21 day: 610 mg/l, Daphnia magna
, EC₁₆, 21 day: 320 mg/l, Daphnia magna
LC₅₀, 21 day: 920 mg/l, Daphnia magna

MORPHOLINE

Acute aquatic toxicity

Acute toxicity - fish LC₅₀, 96 hours: 180 mg/l, Oncorhynchus mykiss (Rainbow trout)

Acute toxicity - aquatic invertebrates EC₅₀, 48 hours: 45 mg/l, Daphnia magna
OECD 202

Acute toxicity - aquatic plants EC₅₀, 96 hours: 28 mg/l, Pseudokirchneriella subcapitata

Acute toxicity - microorganisms EC₂₀, 30 minutes: > 1000 mg/l, Activated sludge

Chronic aquatic toxicity

Chronic toxicity - fish early life stage Scientifically unjustified.

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Chronic toxicity - aquatic invertebrates NOEC, 21 days: 5 mg/l, Daphnia magna

POTASSIUM HYDROXIDE

Acute aquatic toxicity

Acute toxicity - fish LC50, 96 hours: 80 mg/l,

Acute toxicity - aquatic invertebrates EC₅₀, 48 hours: 40 - 240 mg/l, Daphnia magna

12.2. Persistence and degradability

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

Ecological information on ingredients.

CALCIUM CHLORIDE

Persistence and degradability The product contains only inorganic substances which are not biodegradable.

MORPHOLINE

Persistence and degradability The substance is readily biodegradable.

Biodegradation - Degradation (%) 90 - 100: 25 days
OECD 301E

POTASSIUM HYDROXIDE

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

Biodegradation Scientifically unjustified.

12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

Partition coefficient No information available.

Ecological information on ingredients.

CALCIUM CHLORIDE

Bioaccumulative potential The product is not bioaccumulating.

Partition coefficient No information available.

MORPHOLINE

Bioaccumulative potential The product does not contain any substances expected to be bioaccumulating.
BCF: < 2.8, Cyprinus carpio (Common carp) OECD 305 C

Partition coefficient log Kow: -2.55

POTASSIUM HYDROXIDE

Bioaccumulative potential Bioaccumulation is unlikely.

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Partition coefficient Not available.

12.4. Mobility in soil

Mobility The product is soluble in water.

Ecological information on ingredients.

CALCIUM CHLORIDE

Mobility The product is soluble in water. The product contains substances which are bound to particulate matter and are retained in soil.

MORPHOLINE

Mobility The product is soluble in water.

POTASSIUM HYDROXIDE

Mobility The product is soluble in water.

12.5. Results of PBT and vPvB assessment

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

Ecological information on ingredients.

CALCIUM CHLORIDE

Results of PBT and vPvB assessment Not applicable. Substance is inorganic.

MORPHOLINE

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

POTASSIUM HYDROXIDE

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.

Ecological information on ingredients.

CALCIUM CHLORIDE

Other adverse effects No information available.

MORPHOLINE

Other adverse effects Not determined.

POTASSIUM HYDROXIDE

Other adverse effects Not determined.

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information

Waste should be treated as controlled waste. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. Waste packaging should be collected for reuse or recycling. The packaging must be empty (drop-free when inverted).

SECTION 14: Transport information

General

The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

No transport warning sign required.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

No.

14.6. Special precautions for user

Not applicable.

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

Transport in bulk according to Annex II of MARPOL 73/78

and the IBC Code

Not applicable.

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.

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

Inventories

EU - EINECS/ELINCS

All the ingredients are listed or exempt.

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SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet	<p>ATE: Acute Toxicity Estimate.</p> <p>ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.</p> <p>ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.</p> <p>CAS: Chemical Abstracts Service.</p> <p>DNEL: Derived No Effect Level.</p> <p>IATA: International Air Transport Association.</p> <p>IMDG: International Maritime Dangerous Goods.</p> <p>Kow: Octanol-water partition coefficient.</p> <p>LC₅₀: Lethal Concentration to 50 % of a test population.</p> <p>LD₅₀: Lethal Dose to 50% of a test population (Median Lethal Dose).</p> <p>PBT: Persistent, Bioaccumulative and Toxic substance.</p> <p>PNEC: Predicted No Effect Concentration.</p> <p>REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006.</p> <p>RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.</p> <p>vPvB: Very Persistent and Very Bioaccumulative.</p> <p>IARC: International Agency for Research on Cancer.</p> <p>MARPOL 73/78: International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978.</p> <p>cATpE: Converted Acute Toxicity Point Estimate.</p> <p>BCF: Bioconcentration Factor.</p> <p>BOD: Biochemical Oxygen Demand.</p> <p>EC₅₀: 50% of maximal Effective Concentration.</p> <p>LOAEC: Lowest Observed Adverse Effect Concentration.</p> <p>LOAEL: Lowest Observed Adverse Effect Level.</p> <p>NOAEC: No Observed Adverse Effect Concentration.</p> <p>NOAEL: No Observed Adverse Effect Level.</p> <p>NOEC: No Observed Effect Concentration.</p> <p>LOEC: Lowest Observed Effect Concentration.</p> <p>DMEL: Derived Minimal Effect Level.</p> <p>EL50: Exposure Limit 50</p> <p>hPa: Hectopascal</p> <p>LL50: Lethal Loading fifty</p> <p>OECD: Organisation for Economic Co-operation and Development</p> <p>POW: Octanol-water partition coefficient</p> <p>SCBA: self-contained breathing apparatus</p> <p>STP: Sewage Treatment Plant</p> <p>VOC: Volatile Organic Compounds</p>
Classification abbreviations and acronyms	<p>Acute Tox. = Acute toxicity</p> <p>Aquatic Acute = Hazardous to the aquatic environment (acute)</p> <p>Aquatic Chronic = Hazardous to the aquatic environment (chronic)</p>
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	06/06/2018
Version number	2.000
Supersedes date	25/07/2016

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SDS number	10853
SDS status	Approved.
Hazard statements in full	H226 Flammable liquid and vapour. H290 May be corrosive to metals. H302 Harmful if swallowed. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H319 Causes serious eye irritation. H331 Toxic if inhaled. H373 May cause damage to organs through prolonged or repeated exposure. H412 Harmful to aquatic life with long lasting effects.
Signature	Jitendra Panchal



Exposure scenario

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

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Formulation & (re)packing of substances and mixtures - Industrial
Process scope	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
Main sector	SU3 Industrial uses
Sector of use	SU10 Formulation [mixing] of preparations and/or re-packaging
<u>Environment</u>	
Environmental release category	ERC2 Formulation of preparations. ERC3 Formulation in materials.
<u>Worker</u>	
Process category	PROC3 Use in closed batch process (synthesis or formulation). PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC15 Use as laboratory reagent.

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

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

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

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

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Avoid carrying out operation for more than 4 hours.

Other given operational conditions affecting workers exposure

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

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

Technical protective measures	Transfer via enclosed lines. Ensure samples are obtained under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Clear transfer lines prior to de-coupling. PROC15 Use as laboratory reagent. Handle in a fume cupboard or under extract ventilation.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures.
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Risk management measures

Use suitable eye protection.
Wear suitable working clothes.
Wear suitable face shield.
Wear chemically-resistant gloves (tested to EN374) in combination with specific activity training.

Additional advice	Avoid frequent contact with substance. Store substance within a closed system.
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3. Exposure estimation (Health 1)

Assessment method	ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.
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Formulation & (re)packing of substances and mixtures - Industrial

Exposure

PROC3 Use in closed batch process (synthesis or formulation).

Worker - dermal, long-term - systemic: Exposure 0.0686 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.066

Worker - inhalation, short-term - local and systemic: Exposure 9.0771 mg/m³, DNEL 91 mg/m³, RCR 0.0997

PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).

Worker - dermal, short-term - systemic: Exposure 0.686 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 10.893 mg/m³, DNEL 91 mg/m³, RCR 0.120

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 3.2678 mg/m³, DNEL 91 mg/m³, RCR 0.036

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

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 10.8925 mg/m³, DNEL 91 mg/m³, RCR 0.120

PROC15 Use as laboratory reagent.

Worker - dermal, long-term - systemic: Exposure 0.686 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.659

Worker - inhalation, long-term - local and systemic: Exposure 3.6308 mg/m³, DNEL 91 mg/m³, RCR 0.0399

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use as an intermediate

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use as an intermediate
Process scope	Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/berth, road/rail car and bulk container).
Product category	PC19 Intermediate. PC32 Polymer preparations and compounds.
Main sector	SU3 Industrial uses
<u>Environment</u>	
Environmental release category	ERC6a Industrial use resulting in manufacture of another substance (use of intermediates). ERC6d Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers.
<u>Worker</u>	
Process category	PROC1 Use in closed process, no likelihood of exposure. PROC2 Use in closed, continuous process with occasional controlled exposure PROC3 Use in closed batch process (synthesis or formulation). PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises. PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC15 Use as laboratory reagent.

Use as an intermediate

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

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

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

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Avoid carrying out operation for more than 4 hours.

Other given operational conditions affecting workers exposure

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

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

Technical protective measures	Transfer via enclosed lines. Ensure samples are obtained under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Clear transfer lines prior to de-coupling. Fill containers/cans at dedicated fill points supplied with local extract ventilation. Use drum pumps. PROC15 Use as laboratory reagent. Handle in a fume cupboard or under extract ventilation.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures.
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Risk management measures

Use suitable eye protection.
 Wear suitable working clothes.
 Wear suitable face shield.
 Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.
 PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
 Wear chemically-resistant gloves (tested to EN374) in combination with specific activity training.

Additional advice	Avoid frequent contact with substance. Store substance within a closed system.
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3. Exposure estimation (Health 1)

Use as an intermediate

Assessment method

ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Exposure

PROC1 Use in closed process, no likelihood of exposure.

Worker - dermal, long-term - systemic: Exposure 0.0686 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.066

Worker - inhalation, long-term - local and systemic: Exposure 0.0363 mg/m³, DNEL 91 mg/m³, RCR 0.000399

PROC2 Use in closed, continuous process with occasional controlled exposure

Worker - dermal, long-term - systemic: Exposure 0.2742 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637

Worker - inhalation, long-term - local and systemic: Exposure 3.6308 mg/m³, DNEL 91 mg/m³, RCR 0.0399

PROC3 Use in closed batch process (synthesis or formulation).

Worker - dermal, short-term - systemic: Exposure 0.686 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, short-term - local and systemic: Exposure 9.0771 mg/m³, DNEL 91 mg/m³, RCR 0.0997

PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises.

Worker - dermal, long-term - systemic: Exposure 0.686 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.659

Worker - inhalation, long-term - local and systemic: Exposure 7.2617 mg/m³, DNEL 91 mg/m³, RCR 0.0798

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

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

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 5.4463 mg/m³, DNEL 91 mg/m³, RCR 0.0598

PROC15 Use as laboratory reagent.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 3.2678 mg/m³, DNEL 91 mg/m³, RCR 0.036

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use as a Process chemical

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use as a Process chemical
Process scope	Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.
Product category	PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents
Main sector	SU3 Industrial uses
<u>Environment</u>	
Environmental release category	ERC4 Industrial use of processing aids in processes and products, not becoming part of articles. ERC5 Industrial use resulting in inclusion into or onto a matrix.
<u>Worker</u>	
Process category	PROC1 Use in closed process, no likelihood of exposure. PROC2 Use in closed, continuous process with occasional controlled exposure PROC3 Use in closed batch process (synthesis or formulation). PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises. PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

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

Control of environmental exposure

Use as a Process chemical

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 40 %.

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

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

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

Technical protective measures Transfer via enclosed lines. Ensure samples are obtained under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Clear transfer lines prior to de-coupling. Use drum pumps. PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Use long-handled tools where possible.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Use suitable eye protection.
Wear suitable working clothes.
Wear suitable face shield.
Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Additional advice Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Use as a Process chemical

Exposure

PROC1 Use in closed process, no likelihood of exposure.

Worker - dermal, long-term - systemic: Exposure 0.0274 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.0264

Worker - inhalation, long-term - local and systemic: Exposure 0.0145 mg/m³, DNEL 91 mg/m³, RCR 0.000159

PROC2 Use in closed, continuous process with occasional controlled exposure

Worker - dermal, long-term - systemic: Exposure 0.1097 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1055

Worker - inhalation, long-term - local and systemic: Exposure 1.4523 mg/m³, DNEL 91 mg/m³, RCR 0.0159

PROC3 Use in closed batch process (synthesis or formulation).

Worker - dermal, short-term - systemic: Exposure 0.0274 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.0264

Worker - inhalation, short-term - local and systemic: Exposure 3.631 mg/m³, DNEL 91 mg/m³, RCR 0.0399

PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises.

Worker - dermal, long-term - systemic: Exposure 0.5486 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.5275

Worker - inhalation, long-term - local and systemic: Exposure 2.9047 mg/m³, DNEL 91 mg/m³, RCR 0.0319

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.5486 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.5275

Worker - inhalation, long-term - local and systemic: Exposure 7.2617 mg/m³, DNEL 91 mg/m³, RCR 0.0798

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.5486 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.5275

Worker - inhalation, long-term - local and systemic: Exposure 2.1785 mg/m³, DNEL 91 mg/m³, RCR 0.0239

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use as Corrosion Inhibitor

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use as Corrosion Inhibitor
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC7 Industrial use of substances in closed systems.
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Worker

Process category	PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 40 %.

Use as Corrosion Inhibitor

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

Setting Indoor.

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

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

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

Technical protective measures Provide extract ventilation to points where emissions occur. Ensure material transfers are under containment or extract ventilation. Use drum pumps. Clear transfer lines prior to de-coupling.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Use suitable eye protection.

Wear suitable working clothes.

Wear suitable face shield.

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

Additional advice Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Exposure

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
 Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637
 Worker - inhalation, long-term - local and systemic: Exposure 1.8154 mg/m³, DNEL 91 mg/m³, RCR 0.0199

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
 Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319
 Worker - inhalation, long-term - local and systemic: Exposure 0.5446 mg/m³, DNEL 91 mg/m³, RCR 0.00598

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use in gas treatment

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use in gas treatment
Main sector	SU3 Industrial uses

Environment

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

Process category	PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC16 Using material as fuel sources, limited exposure to unburned product to be expected.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C

Use in gas treatment

Concentration details Covers concentrations up to 35 %.

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

Setting Indoor.

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

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

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

Technical protective measures Provide extract ventilation to points where emissions occur. Ensure material transfers are under containment or extract ventilation. Use drum pumps. Clear transfer lines prior to de-coupling.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Use suitable eye protection.

Wear suitable working clothes.

Wear suitable face shield.

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

Additional advice Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Exposure

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
 Worker - dermal, long-term - systemic: Exposure 0.96 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.9231
 Worker - inhalation, long-term - local and systemic: Exposure 6.354 mg/m³, DNEL 91 mg/m³, RCR 0.0698

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
 Worker - dermal, long-term - systemic: Exposure 0.480 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.4615
 Worker - inhalation, long-term - local and systemic: Exposure 1.9062 mg/m³, DNEL 91 mg/m³, RCR 0.0209

PROC16 Using material as fuel sources, limited exposure to unburned product to be expected.
 Worker - dermal, long-term - systemic: Exposure 0.024 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.0231
 Worker - inhalation, long-term - local and systemic: Exposure 0.6354 mg/m³, DNEL 91 mg/m³, RCR 0.00698

The use is assessed to be safe.

Use in gas treatment

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Formulation & (repacking of substances and mixtures - Professional

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Formulation & (repacking of substances and mixtures - Professional
Process scope	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
Main sector	SU22 Professional uses
Sector of use	SU5 Manufacture of textiles, leather, fur SU6a Manufacture of wood and wood products SU6b Manufacture of pulp, paper and paper products SU7 Printing and reproduction of recorded media SU12 Manufacture of plastics products, including compounding and conversion SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU18 Manufacture of furniture SU19 Building and construction work

Environment

Environmental release category	ERC8a Wide dispersive indoor use of processing aids in open systems. ERC8b Wide dispersive indoor use of reactive substances in open systems. ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix. ERC8d Wide dispersive outdoor use of processing aids in open systems. ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix.
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Worker

Formulation & (repacking of substances and mixtures - Professional

Process category	<p>PROC1 Use in closed process, no likelihood of exposure.</p> <p>PROC2 Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3 Use in closed batch process (synthesis or formulation).</p> <p>PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises.</p> <p>PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.</p> <p>PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.</p> <p>PROC10 Roller application or brushing of adhesive and other coating.</p> <p>PROC11 Spraying outside industrial settings and/or applications.</p> <p>PROC13 Treatment of articles by dipping and pouring.</p> <p>PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.</p> <p>PROC15 Use as laboratory reagent.</p>
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 10 %.

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.
Ventilation rate	Provide a good standard of controlled ventilation (10 to 15 air changes per hour). , or: Ensure operation is undertaken outdoors.

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

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

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Formulation & (repacking of substances and mixtures - Professional

Use suitable eye protection and gloves.

Wear suitable working clothes.

Wear suitable face shield.

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

PROC10 Roller application or brushing of adhesive and other coating.

PROC11 Spraying outside industrial settings and/or applications.

PROC13 Treatment of articles by dipping and pouring.

Wear a respirator providing a minimum efficiency of (%): 90

, or:

Ensure operation is undertaken outdoors.

PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.

Without local exhaust ventilation

Wear a respirator providing a minimum efficiency of (%): 90

Additional advice

Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method

ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Formulation & (repacking of substances and mixtures - Professional

Exposure

PROC1 Use in closed process, no likelihood of exposure.

Worker - dermal, long-term - systemic: Exposure 0.0343 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.033

Worker - inhalation, long-term - local and systemic: Exposure 0.0036 mg/m³, DNEL 91 mg/m³, RCR 0.00396

PROC2 Use in closed, continuous process with occasional controlled exposure

Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319

Worker - inhalation, long-term - local and systemic: Exposure 7.2627 mg/m³, DNEL 91 mg/m³, RCR 0.0798

PROC3 Use in closed batch process (synthesis or formulation).

Worker - dermal, long-term - systemic: Exposure 0.0343 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.033

Worker - inhalation, short-term - local and systemic: Exposure 9.077 mg/m³, DNEL 91 mg/m³, RCR 0.0997

PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

PROC13 Treatment of articles by dipping and pouring.

Worker - inhalation, long-term - local and systemic: Exposure 25.4158 mg/m³, DNEL 91 mg/m³, RCR 0.279

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC10 Roller application or brushing of adhesive and other coating.

Worker - dermal, long-term - systemic: Exposure 0.5486 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.5275

Worker - inhalation, long-term - local and systemic: Exposure 7.2617 mg/m³, DNEL 91 mg/m³, RCR 0.0798

PROC11 Spraying outside industrial settings and/or applications.

Worker - dermal, long-term - systemic: Exposure 0.5357 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.5151

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.

Worker - dermal, long-term - systemic: Exposure 0.686 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.66

Worker - inhalation, long-term - local and systemic: Exposure 3.6308 mg/m³, DNEL 91 mg/m³, RCR 0.0399

PROC15 Use as laboratory reagent.

Worker - dermal, long-term - systemic: Exposure 0.0069 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.066

Worker - inhalation, long-term - local and systemic: Exposure 3.6308 mg/m³, DNEL 91 mg/m³, RCR 0.0399

Formulation & (repacking of substances and mixtures - Professional

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use in Cleaning Agents - Industrial

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use in Cleaning Agents - Industrial
Process scope	Covers the use as a component of cleaning products, including transfer from storage, pouring/unloading from drums or containers and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.
Product category	PC35 Washing and cleaning products (including solvent-based products).
Main sector	SU3 Industrial uses
<u>Environment</u>	
Environmental release category	ERC4 Industrial use of processing aids in processes and products, not becoming part of articles. ERC5 Industrial use resulting in inclusion into or onto a matrix.
<u>Worker</u>	
Process category	PROC7 Spraying in industrial settings and applications. PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC10 Roller application or brushing of adhesive and other coating. PROC13 Treatment of articles by dipping and pouring.

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

Control of environmental exposure

Use in Cleaning Agents - Industrial

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 10 %.

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 use at not more than 20°C above ambient temperature, unless stated differently.
Ventilation rate	Provide a good standard of controlled ventilation (10 to 15 air changes per hour). , or: Ensure operation is undertaken outdoors.

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

Technical protective measures Use drum pumps. Other protection measures such as segregation of activity, minimisation of personnel, respiratory protection, impervious suits and face shields should also be considered for high dispersion activities which are likely to lead to substantial aerosol or vapour release, e.g. spraying.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Use suitable eye protection.
Wear suitable working clothes.
Wear suitable face shield.
Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Additional advice Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Use in Cleaning Agents - Industrial

Exposure

PROC7 Spraying in industrial settings and applications.

Worker - dermal, long-term - systemic: Exposure 0.8571 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.8242

Worker - inhalation, long-term - local and systemic: Exposure 9.0771 mg/m³, DNEL 91 mg/m³, RCR 0.0997

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319

PROC10 Roller application or brushing of adhesive and other coating.

Worker - dermal, long-term - systemic: Exposure 0.5486 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.5275

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC13 Treatment of articles by dipping and pouring.

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use in Cleaning Agents - Professional

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use in Cleaning Agents - Professional
Process scope	Covers the use as a component of cleaning products, including transfer from storage, pouring/unloading from drums or containers and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.
Product category	PC35 Washing and cleaning products (including solvent-based products).
Main sector	SU22 Professional uses
<u>Environment</u>	
Environmental release category	ERC8a Wide dispersive indoor use of processing aids in open systems. ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix. ERC8d Wide dispersive outdoor use of processing aids in open systems. ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix.
<u>Worker</u>	
Process category	PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC10 Roller application or brushing of adhesive and other coating. PROC11 Spraying outside industrial settings and/or applications. PROC13 Treatment of articles by dipping and pouring.

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

Control of environmental exposure

Use in Cleaning Agents - Professional

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 10 %.

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 use at not more than 20°C above ambient temperature, unless stated differently.
Ventilation rate	Provide a good standard of controlled ventilation (10 to 15 air changes per hour). , or: Ensure operation is undertaken outdoors.

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

Technical protective measures Use drum pumps. Other protection measures such as segregation of activity, minimisation of personnel, respiratory protection, impervious suits and face shields should also be considered for high dispersion activities which are likely to lead to substantial aerosol or vapour release, e.g. spraying.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Avoid manual contact with wet work pieces.

Risk management measures

Use suitable eye protection.
Wear suitable working clothes.
Wear suitable face shield.
Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Additional advice Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Use in Cleaning Agents - Professional

Exposure

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

PROC13 Treatment of articles by dipping and pouring.

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637

Worker - inhalation, long-term - local and systemic: Exposure 25.4158 mg/m³, DNEL 91 mg/m³, RCR 0.279

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC10 Roller application or brushing of adhesive and other coating.

Worker - dermal, long-term - systemic: Exposure 0.5486 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.5275

Worker - inhalation, long-term - local and systemic: Exposure 25.4158 mg/m³, DNEL 91 mg/m³, RCR 0.279

PROC11 Spraying outside industrial settings and/or applications.

Worker - dermal, long-term - systemic: Exposure 0.5357 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.5151

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use in Hydraulic fluids - Industrial

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use in Hydraulic fluids - Industrial
Process scope	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment, including maintenance and related material transfers.
Main sector	SU3 Industrial uses
<u>Environment</u>	
Environmental release category	ERC4 Industrial use of processing aids in processes and products, not becoming part of articles.
<u>Worker</u>	
Process category	PROC17 Lubrication at high energy conditions and in partly open process. PROC18 Greasing at high energy conditions.

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

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 5 %.

Use in Hydraulic fluids - Industrial

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

Setting Indoor.

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

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

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Use suitable eye protection.

Wear suitable working clothes.

Wear suitable face shield.

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

Additional advice Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Exposure PROC17 Lubrication at high energy conditions and in partly open process.
Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637
PROC18 Greasing at high energy conditions.
Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319
Worker - inhalation, long-term - local and systemic: Exposure 0.4539 mg/m³, DNEL 91 mg/m³, RCR 0.00499

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use in Hydraulic fluids - Professional

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use in Hydraulic fluids - Professional
Process scope	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment, including maintenance and related material transfers.
Main sector	SU22 Professional uses
<u>Environment</u>	
Environmental release category	ERC8a Wide dispersive indoor use of processing aids in open systems.
<u>Worker</u>	
Process category	PROC17 Lubrication at high energy conditions and in partly open process. PROC18 Greasing at high energy conditions. PROC20 Heat and pressure transfer fluids in dispersive use but closed systems.

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

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C

Use in Hydraulic fluids - Professional

Concentration details Covers concentrations up to 5 %.

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

Setting Indoor.

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

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

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Use suitable eye protection.
Wear suitable working clothes.
Wear suitable face shield.
Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Additional advice Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Exposure

PROC17 Lubrication at high energy conditions and in partly open process.
Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637
Worker - inhalation, long-term - local and systemic: Exposure 3.6308 mg/m³, DNEL 91 mg/m³, RCR 0.0399

PROC18 Greasing at high energy conditions.
Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319

PROC20 Heat and pressure transfer fluids in dispersive use but closed systems.
Worker - dermal, long-term - systemic: Exposure 0.0171 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.0165
Worker - inhalation, long-term - local and systemic: Exposure 0.7262 mg/m³, DNEL 91 mg/m³, RCR 0.00798

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Use of dyed paper products - Industrial

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use of dyed paper products - Industrial
Main sector	SU3 Industrial uses
Sector of use	SU6 Manufacture of paper and paper products

Environment

Environmental release category	ERC5 Industrial use resulting in inclusion into or onto a matrix.
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Worker

Process category	PROC1 Use in closed process, no likelihood of exposure. PROC7 Spraying in industrial settings and applications. PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC13 Treatment of articles by dipping and pouring. PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Use of dyed paper products - Industrial

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

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

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

Technical protective measures Handle substance within a predominantly closed system provided with extract ventilation. Provide extract ventilation to points where emissions occur. Fill containers/cans at dedicated fill points supplied with local extract ventilation. Use drum pumps. Other protection measures such as segregation of activity, minimisation of personnel, respiratory protection, impervious suits and face shields should also be considered for high dispersion activities which are likely to lead to substantial aerosol or vapour release, e.g. spraying.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Use suitable eye protection.
Wear suitable working clothes.
Wear suitable face shield.
Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Additional advice Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Use of dyed paper products - Industrial

Exposure

PROC1 Use in closed process, no likelihood of exposure.

Worker - dermal, long-term - systemic: Exposure 0.0686 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.066

Worker - inhalation, long-term - local and systemic: Exposure 0.0363 mg/m³, DNEL 91 mg/m³, RCR 0.000399

PROC7 Spraying in industrial settings and applications.

Worker - dermal, long-term - systemic: Exposure 0.8571 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.8242

Worker - inhalation, long-term - local and systemic: Exposure 4.5385 mg/m³, DNEL 91 mg/m³, RCR 0.0499

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 5.4463 mg/m³, DNEL 91 mg/m³, RCR 0.0598

PROC13 Treatment of articles by dipping and pouring.

PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Use of dyed paper products - Professional

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use of dyed paper products - Professional
Main sector	SU3 Industrial uses
Sector of use	SU6b Manufacture of pulp, paper and paper products

Environment

Environmental release category	ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix.
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Worker

Process category	PROC1 Use in closed process, no likelihood of exposure. PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC11 Spraying outside industrial settings and/or applications. PROC13 Treatment of articles by dipping and pouring. PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Use of dyed paper products - Professional

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

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

Other given operational conditions affecting workers exposure

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

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

Technical protective measures Handle substance within a predominantly closed system provided with extract ventilation. Provide extract ventilation to points where emissions occur. Fill containers/cans at dedicated fill points supplied with local extract ventilation. Use drum pumps. Other protection measures such as segregation of activity, minimisation of personnel, respiratory protection, impervious suits and face shields should also be considered for high dispersion activities which are likely to lead to substantial aerosol or vapour release, e.g. spraying.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Use suitable eye protection.
Wear suitable working clothes.
Wear suitable face shield.
Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Additional advice Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Use of dyed paper products - Professional

Exposure

PROC1 Use in closed process, no likelihood of exposure.

Worker - dermal, long-term - systemic: Exposure 0.0686 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.066

Worker - inhalation, long-term - local and systemic: Exposure 0.0363 mg/m³, DNEL 91 mg/m³, RCR 0.000399

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 7.2617 mg/m³, DNEL 91 mg/m³, RCR 0.0798

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC11 Spraying outside industrial settings and/or applications.

Worker - dermal, long-term - systemic: Exposure 0.8571 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.8242

Worker - inhalation, long-term - local and systemic: Exposure 14.5233 mg/m³, DNEL 91 mg/m³, RCR 0.160

PROC13 Treatment of articles by dipping and pouring.

Worker - dermal, long-term - systemic: Exposure 0.6857 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.6593

Worker - inhalation, long-term - local and systemic: Exposure 7.2617 mg/m³, DNEL 91 mg/m³, RCR 0.0798

PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.

Worker - dermal, long-term - systemic: Exposure 0.1714 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1648

Worker - inhalation, long-term - local and systemic: Exposure 7.2617 mg/m³, DNEL 91 mg/m³, RCR 0.0798

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use in Agrochemicals - Industrial

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use in Agrochemicals - Industrial
Process scope	Use in agrochemicals
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC2 Formulation of preparations. ERC4 Industrial use of processing aids in processes and products, not becoming part of articles. ERC5 Industrial use resulting in inclusion into or onto a matrix.
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Worker

Process category	PROC3 Use in closed batch process (synthesis or formulation). PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises. PROC7 Spraying in industrial settings and applications. PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC13 Treatment of articles by dipping and pouring.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Use in Agrochemicals - Industrial

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 10 %.

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 use at not more than 20°C above ambient temperature, unless stated differently.
Ventilation rate	Provide a good standard of controlled ventilation (10 to 15 air changes per hour). , or: Ensure operation is undertaken outdoors.

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

Technical protective measures Use drum pumps. Other protection measures such as segregation of activity, minimisation of personnel, respiratory protection, impervious suits and face shields should also be considered for high dispersion activities which are likely to lead to substantial aerosol or vapour release, e.g. spraying.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Use suitable eye protection.
Wear suitable working clothes.
Wear suitable face shield.
Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Additional advice Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.

Use in Agrochemicals - Industrial

Exposure

PROC3 Use in closed batch process (synthesis or formulation).

Worker - dermal, long-term - systemic: Exposure 0.0069 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.0066

Worker - inhalation, long-term - local and systemic: Exposure 9.0771 mg/m³, DNEL 91 mg/m³, RCR 0.0997

PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises.

Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319

Worker - inhalation, long-term - local and systemic: Exposure 7.2617 mg/m³, DNEL 91 mg/m³, RCR 0.0798

PROC7 Spraying in industrial settings and applications.

Worker - dermal, long-term - systemic: Exposure 0.8571 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.8242

Worker - inhalation, long-term - local and systemic: Exposure 9.0771 mg/m³, DNEL 91 mg/m³, RCR 0.0997

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319

PROC13 Treatment of articles by dipping and pouring.

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Use in Agrochemicals - Professional

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use in Agrochemicals - Professional
Process scope	Use in agrochemicals
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC8a Wide dispersive indoor use of processing aids in open systems. ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix. ERC8d Wide dispersive outdoor use of processing aids in open systems. ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix.
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Worker

Process category	PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC11 Spraying outside industrial settings and/or applications. PROC13 Treatment of articles by dipping and pouring.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Use in Agrochemicals - Professional

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 10 %.
<u>Frequency and duration of use</u>	
	Covers daily exposures up to 8 hours (unless stated differently).
<u>Other given operational conditions affecting workers exposure</u>	
Setting	Indoor/outdoor use.
Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.
Ventilation rate	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) , or: Ensure operation is undertaken outdoors.
<u>Technical conditions and measures at process level (source) to prevent release</u>	
Technical protective measures	Avoid manual contact with wet work pieces. Use drum pumps. PROC11 Spraying outside industrial settings and/or applications. Spraying (automatic/robotic) Carry out in a vented booth or extracted enclosure.
<u>Organisational measures to prevent/limit releases, dispersion and exposure</u>	
Organisational measures	Ensure operatives are trained to minimise exposures.
<u>Risk management measures</u>	
	Use suitable eye protection. Wear suitable working clothes. Wear suitable face shield. Wear chemically-resistant gloves (tested to EN374) in combination with 'basic' employee training. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Additional advice	Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method	ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.
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Use in Agrochemicals - Professional

Exposure

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

PROC13 Treatment of articles by dipping and pouring.

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637

Worker - inhalation, long-term - local and systemic: Exposure 25.4158 mg/m³, DNEL 91 mg/m³, RCR 0.279

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC11 Spraying outside industrial settings and/or applications.

Worker - dermal, long-term - systemic: Exposure 0.5357 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.5151

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario Use in concrete and cement

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Use in concrete and cement
Main sector	SU22 Professional uses
Sector of use	SU19 Building and construction work

Environment

Environmental release category	ERC8d Wide dispersive outdoor use of processing aids in open systems. ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix. ERC10a Wide dispersive outdoor use of long-life articles and materials with low release.
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Worker

Process category	PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC10 Roller application or brushing of adhesive and other coating. PROC11 Spraying outside industrial settings and/or applications. PROC24 High (mechanical) energy work-up of substances bound in materials and/or articles
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Control of environmental exposure

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Use in concrete and cement

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Covers concentrations up to 1 %.
<u>Frequency and duration of use</u>	
	Covers daily exposures up to 8 hours (unless stated differently).
<u>Other given operational conditions affecting workers exposure</u>	
Setting	Indoor/outdoor use.
Temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors.
<u>Technical conditions and measures at process level (source) to prevent release</u>	
Technical protective measures	No specific risk management measure identified beyond those operational conditions stated.
<u>Organisational measures to prevent/limit releases, dispersion and exposure</u>	
Organisational measures	Ensure operatives are trained to minimise exposures.
<u>Risk management measures</u>	
	Wear suitable working clothes.
Additional advice	Avoid frequent contact with substance. Store substance within a closed system.

3. Exposure estimation (Health 1)

Assessment method	ECETOC TRA v2.0 Worker; modified version ECETOC TRA modified version: reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates. ECETOC TRA modified version: use of gloves has been considered additionally.
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Use in concrete and cement

Exposure

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.1371 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.1319

Worker - inhalation, long-term - local and systemic: Exposure 3.6308 mg/m³, DNEL 91 mg/m³, RCR 0.0399

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Worker - dermal, long-term - systemic: Exposure 0.0686 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.0659

Worker - inhalation, long-term - local and systemic: Exposure 1.8154 mg/m³, DNEL 91 mg/m³, RCR 0.0199

PROC10 Roller application or brushing of adhesive and other coating.

Worker - dermal, long-term - systemic: Exposure 0.2743 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.2637

Worker - inhalation, long-term - local and systemic: Exposure 3.6308 mg/m³, DNEL 91 mg/m³, RCR 0.0399

PROC11 Spraying outside industrial settings and/or applications.

Worker - dermal, long-term - systemic: Exposure 0.2143 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.206

Worker - inhalation, long-term - local and systemic: Exposure 18.1542 mg/m³, DNEL 91 mg/m³, RCR 0.199

PROC24 High (mechanical) energy work-up of substances bound in materials and/or articles

Worker - dermal, long-term - systemic: Exposure 0.0283 mg/kg/day, DNEL 1.04 mg/kg/day, RCR 0.0272

Worker - inhalation, long-term - local and systemic: Exposure 0.0500 mg/m³, DNEL 91 mg/m³, RCR 0.000549

The use is assessed to be safe.

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

For scaling see <http://www.ecetoc.org/tra>



Exposure scenario

Formulation & (re)packing of substances and mixtures - Consumer

Identification

Product name	Morpholine
REACH registration number	01-2119496057-30-XXXX
CAS number	110-91-8
EC number	203-815-1
EU index number	613-028-00-9
Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com

1. Title of exposure scenario

Main title	Formulation & (re)packing of substances and mixtures - Consumer
Process scope	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
Product category	PC1 Adhesives, sealants. PC4 Anti-freeze and de-icing products. PC8 Biocidal products. PC9a Coatings and paints, thinners, paint removers. PC13 Fuels. PC18 Ink and toners. PC26 Paper and board dye, finishing and impregnation products, including bleaches and other processing aids. PC30 Photochemicals. PC31 Polishes and wax blends. PC35 Washing and cleaning products (including solvent-based products).
Main sector	SU21 Consumer uses
<u>Environment</u>	
Environmental release category	ERC8a Wide dispersive indoor use of processing aids in open systems. ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix. ERC8d Wide dispersive outdoor use of processing aids in open systems. ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix.

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

Formulation & (re)packing of substances and mixtures - Consumer

Control of environmental exposure (Non-industrial)

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

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

Product characteristics

Physical state	Liquid
Vapour pressure	9.8 hPa @ 20°C
Concentration details	Concentration of substance in product: 0.5% Unless otherwise stated. PC8 Biocidal products. Concentration of substance in product: 0.74% PC18 Ink and toners. PC30 Photochemicals. Concentration of substance in product: 2% PC26 Paper and board dye, finishing and impregnation products, including bleaches and other processing aids. PC31 Polishes and wax blends. Concentration of substance in product: 1% PC35 Washing and cleaning products (including solvent-based products). Concentration of substance in product: 10%

Amounts used

Amount per use: 75 g
Unless otherwise stated.
PC1 Adhesives, sealants.
Assembly sealants
Amount per use: 97.5 g
PC9a Coatings and paints, thinners, paint removers.
Amount per use: 500 g
PC18 Ink and toners.
PC30 Photochemicals.
Amount per use: 313 g

Frequency and duration of use

Covers daily exposure up to 60minutes
Unless otherwise stated.
PC31 Polishes and wax blends.
Furniture polish
Covers daily exposure up to 240minutes

Other given operational conditions affecting Non-industrial exposure

Setting	Indoor.
Room size	Covers use in room size of 20 m ³ . Unless otherwise stated. PC1 Adhesives, sealants. Joint sealants Covers use in room size of 10 m ³ . PC4 Anti-freeze and de-icing products. PC8 Biocidal products. PC9a Coatings and paints, thinners, paint removers. PC31 Polishes and wax blends. Metal cleaners Covers use in room size of 15 m ³ . PC31 Polishes and wax blends. Furniture polish Covers use in room size of 58 m ³ .
Ventilation rate	Covers use under typical household ventilation.

3. Exposure estimation (Health 1)

Assessment method	ConsExpo v4.1 Unless otherwise stated. PC26 Paper and board dye, finishing and impregnation products, including bleaches and other processing aids. ART 1.0
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Formulation & (re)packing of substances and mixtures - Consumer

Exposure

PC1 Adhesives, sealants.

Consumer - inhalation, short-term - local: Exposure 14.6 mg/m³, DNEL 18 mg/m³, RCR 0.8111

Consumer - inhalation, long-term - local and systemic: Exposure 0.0017 mg/m³, DNEL 3.2 mg/m³, RCR 0.000531

Consumer - dermal, long-term - systemic: Exposure 0.0001 mg/kg/day, DNEL 0.52 mg/kg/day, RCR 0.0002

PC4 Anti-freeze and de-icing products.

Consumer - inhalation, short-term - local: Exposure 0.0104 mg/m³, DNEL 18 mg/m³, RCR 0.0006

Consumer - inhalation, long-term - local and systemic: Exposure 0.0004 mg/m³, DNEL 3.2 mg/m³, RCR 0.000125

Consumer - dermal, long-term - systemic: Exposure 0.0018 mg/kg/day, DNEL 0.52 mg/kg/day, RCR 0.0035

PC8 Biocidal products.

Consumer - inhalation, short-term - local: Exposure 0.0154 mg/m³, DNEL 18 mg/m³, RCR 0.0006

Consumer - dermal, long-term - local and systemic: Exposure 0.0006 mg/m³, DNEL 3.2 mg/m³, RCR 0.0001875

Consumer - dermal, long-term - systemic: Exposure 0.0027 mg/kg/day, DNEL 0.52 mg/kg/day, RCR 0.0051

PC9a Coatings and paints, thinners, paint removers.

Consumer - inhalation, short-term - local: Exposure 12.7 mg/m³, DNEL 18 mg/m³, RCR 0.7056

Consumer - inhalation, long-term - local and systemic: Exposure 0.0015 mg/m³, DNEL 3.2 mg/m³, RCR 0.000469

Consumer - dermal, long-term - systemic: Exposure 0.0008 mg/kg/day, DNEL 0.52 mg/kg/day, RCR 0.0015

PC18 Ink and toners.

Consumer - inhalation, short-term - local: Exposure 13.3 mg/m³, DNEL 18 mg/m³, RCR 0.7389

Consumer - inhalation, long-term - local and systemic: Exposure 0.0008 mg/m³, DNEL 3.2 mg/m³, RCR 0.00025

Consumer - dermal, long-term - systemic: Exposure 0.0030 mg/kg/day, DNEL 0.52 mg/kg/day, RCR 0.0058

PC26 Paper and board dye, finishing and impregnation products, including bleaches and other processing aids.

Consumer - inhalation, short-term - local: Exposure 6.6 mg/m³, DNEL 18 mg/m³, RCR 0.3667

Consumer - inhalation, long-term - local and systemic: Exposure 1.9 mg/m³, DNEL 3.2 mg/m³, RCR 0.594

PC31 Polishes and wax blends.

Metal cleaners

Consumer - inhalation, short-term - local: Exposure 2.35 mg/m³, DNEL 18 mg/m³, RCR 0.1306

Consumer - inhalation, long-term - local and systemic: Exposure 0.0016 mg/m³, DNEL 3.2 mg/m³, RCR 0.0005

Consumer - dermal, long-term - systemic: Exposure 0.0003 mg/kg/day, DNEL 0.52 mg/kg/day, RCR 0.0005

PC31 Polishes and wax blends.

Furniture polish

Consumer - inhalation, short-term - local: Exposure 3.66 mg/m³, DNEL 18 mg/m³, RCR 0.2033

Consumer - inhalation, long-term - local and systemic: Exposure 0.0016 mg/m³, DNEL 3.2 mg/m³, RCR 0.0005

Consumer - dermal, long-term - systemic: Exposure 0.0002 mg/kg/day, DNEL 0.52

Formulation & (re)packing of substances and mixtures - Consumer

mg/kg/day, RCR 0.0004

PC35 Washing and cleaning products (including solvent-based products).

Consumer - dermal, long-term - systemic: Exposure 0.35 mg/kg/day, DNEL 0.52 mg/kg/day, RCR 0.67

PC31 Polishes and wax blends.

Shoe cream

Consumer - dermal, long-term - systemic: Exposure 0.011 mg/kg/day, DNEL 0.52 mg/kg/day, RCR 0.0211

The use is assessed to be safe.

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

For scaling see <http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp>

<http://www.advancedreachtool.com>