SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
UK REACH Regulations (SI 2019/758 as amended)

Supercedes date 03-Jul-2018 **Revision date** 21-Oct-2024 **Revision Number** 3

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

1.1. Product identifier

Product Code(s) 20794

Safety data sheet number 20794

Product Name 2-ETHYLHEXANOL

EC Number 203-234-3

CAS No 104-76-7

Synonyms ISO OCTANOL, 2 ETHYLHEXAN-1-OL, AFA-2,, 2EH, ETHANOL, 2-(2-BUTOXYETHOXY)

Pure substance/mixture Substance

Contains 2-ETHYLHEXANOL

Molecular weight 130.23

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

Recommended use

Manufacture of substance
Formulation & (re)packing of substances and mixtures.
Distribution of substance
Storage Solution.
Coatings
Functional fluids
Cleaning agent
Use in oil and gas field drilling and production operations
Intermediate
Diluent
Chemical
For further information, see attached Exposure Scenario

1.3. Details of the supplier of the safety data sheet

Supplier
Univar Solutions UK Ltd
Aquarius House
6 Mid Point Business Park
Bradford
GBR

For further information, please contact

E-mail address SDS.EMEA@univarsolutions.com

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

1.4. Emergency telephone number

Emergency Telephone SGS - +32 (0)3 575 55 55 (24h)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Acute toxicity - Inhalation (Vapours)	Category 4 - (H332)
Skin corrosion/irritation	Category 2 - (H315)
Serious eye damage/eye irritation	Category 2 - (H319)
Specific target organ toxicity — single exposure	Category 3 - (H335)
Category 3 Respiratory irritation	
Chronic aquatic toxicity	Category 3 - (H412)

2.2. Label elements

Contains 2-ETHYLHEXANOL

Signal word
Warning

Hazard statements
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H332 - Harmful if inhaled
H335 - May cause respiratory irritation
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear protective gloves and eye/face protection
P312 - Call a POISON CENTER or doctor if you feel unwell
P321 - Specific treatment (see .? on this label)
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

Additional information
This product requires tactile warnings if supplied to the general public.

2.3. Other hazards

No information available.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Weight-%	EC No (EU Index No)	UK REACH registration number	Classification according to GB CLP (SI 2020/1567 as amended)	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)

2-ETHYLHEXANOL 104-76-7	90 - 100%	203-234-3	-	Acute Tox. 4 (H332) Eye Irrit. 2 (H319) Skin Irrit. 2 (H315) STOT SE 3 (H335) Aquatic Chronic 3(H412)	-	-	-

Full text of H- and EUH-phrases: see section 16

This product does not contain candidate substances of very high concern at a concentration >= 0.1% (UK REACH Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Remove and isolate contaminated clothing and shoes.

Inhalation Remove to fresh air. IF exposed or concerned: Get medical advice/attention. Get medical attention immediately if symptoms occur. If symptoms persist, call a doctor. If breathing has stopped, give artificial respiration. Get medical attention immediately. General first aid, rest, warmth and fresh air.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open while rinsing. Do not rub affected area. Get medical attention if irritation develops and persists.

Skin contact Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical attention if irritation develops and persists.

Ingestion Do NOT induce vomiting. Rinse mouth. Never give anything by mouth to an unconscious person. Get medical attention.

Self-protection of the first aider Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid breathing vapours or mists. Use personal protective equipment as required. See section 8 for more information.

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

Symptoms May cause redness and tearing of the eyes. Burning sensation. Coughing and/ or wheezing. Difficulty in breathing.

Inhalation Coughing and/ or wheezing. Difficulty in breathing.

Eyes Burning sensation. May cause redness and tearing of the eyes.

Dermal Irritating. Erythema (skin redness). Prolonged contact may cause redness and irritation.

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

Note to doctors Treat symptomatically. Remove contaminated clothing and shoes. If ingested, irrigate the stomach using activated charcoal in addition.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media Carbon dioxide (CO2). Water spray. Alcohol resistant foam. Dry chemical.

Large Fire CAUTION: Use of water spray when fighting fire may be inefficient.

Unsuitable extinguishing media Do not scatter spilled material with high pressure water streams.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical Vapours may form explosive mixtures with air. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas.

Hazardous combustion products Carbon monoxide. Carbon dioxide (CO2).

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Cool containers with flooding quantities of water until well after fire is out. Collect contaminated fire extinguishing water separately. Do not allow it to enter drains or surface water.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Avoid contact with skin, eyes or clothing. Avoid breathing vapours or mists. Keep people away from and upwind of spill/leak. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Other information Refer to protective measures listed in Sections 7 and 8.

For emergency responders Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not allow runoff to sewer, waterway or ground. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and material for containment and cleaning up

Methods for containment Keep out of drains, sewers, ditches and waterways. Dike far ahead of larger spills for later disposal.

Methods for cleaning up Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Collect spillage in containers, seal securely and deliver for disposal according to local regulations. Take action to prevent static discharges.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash it before reuse. Ensure adequate ventilation. Avoid breathing vapours or mists. In case of insufficient ventilation, wear suitable respiratory equipment. In case of insufficient ventilation, wear suitable respiratory equipment. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

General hygiene considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Avoid contact with skin, eyes or clothing. Wash hands and face before breaks and

immediately after handling the product. Remove contaminated clothing and protective equipment before entering eating areas. Take off all contaminated clothing and wash it before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Incompatible with oxidising agents. Take precautionary measures against static discharge. Ground and bond containers when transferring material. Keep at temperatures between 0 and 49 °C. Suitable container/equipment material:. stainless steel.

7.3. Specific end use(s)

Specific use(s)
See section 1 for more information.

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical name	United Kingdom
2-ETHYLHEXANOL 104-76-7	TWA: 1 ppm TWA: 5.4 mg/m³ STEL: 3 ppm STEL: 16.2 mg/m³

Biological occupational exposure limits This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Derived No Effect Level (DNEL) - Workers

Chemical name	Oral	Dermal	Inhalation
2-ETHYLHEXANOL 104-76-7		23 mg/kg/day [4] [6]	53.2 mg/m³ [5] [7] 53.2 mg/m³ [5] [6] 12.8 mg/m³ [4] [6]

[4] Systemic health effects.
[5] Local health effects.
[6] Long term.
[7] Short term.

Derived No Effect Level (DNEL) - General Public

Chemical name	Oral	Dermal	Inhalation
2-ETHYLHEXANOL 104-76-7	1.1 mg/kg/day [4] [6]	11.4 mg/kg/day [4] [6]	26.6 mg/m³ [5] [7] 26.6 mg/m³ [5] [6] 2.3 mg/m³ [4] [6]

[4] Systemic health effects.
[5] Local health effects.
[6] Long term.
[7] Short term.

Predicted No Effect Concentration (PNEC)

Chemical name	Freshwater	Freshwater (intermittent release)	Marine water	Marine water (intermittent release)	Air
2-ETHYLHEXANOL 104-76-7	0.017 mg/l 27.8 µg/l	0.17 mg/L 171 µg/l	0.0017 mg/l 2.78 µg/l	17.1 µg/l	

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
2-ETHYLHEXANOL 104-76-7	0.284 mg/kg 272.44 µg/kg dw	0.0284 mg/kg 27.24 µg/kg dw	10 mg/L	0.047 38.2 µg/kg dw	55 mg/kg

8.2. Exposure controls

Engineering controls Ensure adequate ventilation. Ensure that eyewash stations and safety showers are close to the workstation location. Use non sparking handtools and explosion-proof electric equipment. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take action to prevent static discharges.

Personal protective equipment

Eye/face protection If splashes are likely to occur, wear safety glasses with side-shields. Use eye protection according to EN 166.

Hand protection Wear suitable gloves. Impervious gloves. Wear suitable gloves. Ensure that the breakthrough time of the glove material is not exceeded. Refer to glove supplier for information on breakthrough time for specific gloves. Gloves must conform to standard EN 374.

Gloves			
Duration of contact	PPE - Glove material	Glove thickness	Break through time
Long term (repeated)	Nitrile rubber	0.4-0.55 mm	> 480 minutes
Long term (repeated)	Polyvinyl chloride (PVC)	>= 0.8 mm	> 480 minutes

Skin and body protection Wear suitable protective clothing. Long sleeved clothing.

Respiratory protection Use appropriate respiratory protection. Gas filter, type A.
Recommended filter type: Type A1/A2.

General hygiene considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Avoid contact with skin, eyes or clothing. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing and protective equipment before entering eating areas. Take off all contaminated clothing and wash it before reuse.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state Liquid
Appearance Clear liquid
Colour Colourless
Odour Slight. unpleasant. Alcohol.
Odour threshold 0.08 ppm

Property	Values	Remarks • Method
Melting point / freezing point	< -20 °C	
Initial boiling point and boiling range	184 - 186 °C	
Flammability		No information available.
Flammability Limit in Air		No information available.
Upper flammability or explosive	12.7%	

limits		
Lower flammability or explosive limits	1.1%	
Flash point	75 - 77 °C	
Autoignition temperature	260 - 280 °C	
Decomposition temperature		No information available.
pH	5.8	(0,9 g/l in water @ 20 °C (68 °F)) OECD 105.
pH (as aqueous solution)		No information available.
Kinematic viscosity	11,833 mm^2/s	@ 20 °C.
Dynamic viscosity	9.7 - 9.845 mPa s	
Water solubility	0,9 g/l @ 20 °C, in water, OECD 105	
Solubility(ies)		No information available.
Partition coefficient	log Kow: 2.9	
Vapour pressure	<1 hPa @ 20°C	
Relative density	0.832 kg/m^3	@20°C, ISO 2811-2.
Bulk density	0,832 g/cm3	@ 20 °C
Liquid Density	No information available	No information available
Relative vapour density	4.49	@ 20 °C.
Particle characteristics		No information available.
Particle Size	No information available	
Particle Size Distribution	No information available	
Explosive properties	Not considered to be explosive.	
Oxidising properties	Does not meet the criteria for classification as oxidising	

9.2. Other information

Molecular weight 130.23 < 1 (butyl acetate = 1)

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity Stable under normal conditions.

10.2. Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions None under normal processing.

10.4. Conditions to avoid

Conditions to avoid Excessive heat. Keep away from open flames, hot surfaces and sources of ignition.

10.5. Incompatible materials

Incompatible materials Strong acids. Strong bases. Strong oxidising agents. Strong oxidising agents. Acids.

10.6. Hazardous decomposition products

Hazardous decomposition products None known based on information supplied.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure

Product Information

Inhalation Specific test data for the substance or mixture is not available. May cause irritation of respiratory tract. Harmful by inhalation. (based on components).

Eye contact Specific test data for the substance or mixture is not available. Causes serious eye irritation. (based on components). May cause redness, itching, and pain.

Skin contact Specific test data for the substance or mixture is not available. Causes skin irritation. (based on components).

Ingestion Specific test data for the substance or mixture is not available. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Redness. May cause redness and tearing of the eyes. Coughing and/ or wheezing.

Acute toxicity

Numerical measures of toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
2-ETHYLHEXANOL	= 2047 mg/kg (Rat)	> 3000 mg/kg (Rabbit)	> 0.89 - <=5.3 mg/l (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Classification based on data available for ingredients. Causes skin irritation.

2-ETHYLHEXANOL (104-76-7)

Method	Species	Exposure route	Effective dose	Exposure time	Results
OECD Test No. 404: Acute Dermal Irritation/Corrosion	Rabbit	Dermal		4 hours	Irritant

Serious eye damage/eye irritation Classification based on data available for ingredients. Causes serious eye irritation.

2-ETHYLHEXANOL (104-76-7)

Method	Species	Exposure route	Effective dose	Exposure time	Results
OECD Test No. 405: Acute Eye Irritation/Corrosion	Rabbit	eye		4 hours	Irritant

Respiratory or skin sensitisation Based on available data the classification criteria are not met.

2-ETHYLHEXANOL (104-76-7)

Method	Species	Exposure route	Results
	Human evidence	Dermal	Not a skin sensitiser

Germ cell mutagenicity Based on available data the classification criteria are not met.

Component Information
2-ETHYLHEXANOL (104-76-7)

Method	Species	Results
OECD Test No. 471: Bacterial Reverse Mutation Test	in vitro	Negative
OECD Test No. 473: In vitro Mammalian Chromosome Aberration Test	in vitro	Negative
OECD Test No. 476: In Vitro Mammalian Cell Gene Mutation Tests using the Hprt and xprt	in vitro	Negative

genes		
OECD Test No. 474: Mammalian Erythrocyte Micronucleus Test	Mouse	Negative

Carcinogenicity Based on available data the classification criteria are not met.

Component Information
2-ETHYLHEXANOL (104-76-7)

Method	Species	Results
OECD Test No. 451: Carcinogenicity Studies	Mouse	Not Carcinogenic
OECD Test No. 451: Carcinogenicity Studies	Rat	Not Carcinogenic

Reproductive toxicity Based on available data the classification criteria are not met.

2-ETHYLHEXANOL (104-76-7)

Method	Species	Results
OECD Test No. 414: Pre-natal Development Toxicity Study	Mouse	191 mg/kg bw/d NOAEL developmental toxicity
OECD Test No. 414: Pre-natal Development Toxicity Study	Rat	2520 mg/kg NOAEL developmental toxicity
OECD Test No. 414: Pre-natal Development Toxicity Study	Rat	850 mg/m^3 NOAEC
OECD Test No. 416: Two-Generation Reproduction Toxicity	Rat	10000 ppm NOAEL P-gen.
OECD Test No. 416: Two-Generation Reproduction Toxicity	Rat	3000 ppm NOAEL

STOT - single exposure May cause respiratory irritation.

2-ETHYLHEXANOL (104-76-7)

Method	Species	Exposure route	Effective dose	Exposure time	Results
	human data				May cause respiratory irritation

STOT - repeated exposure Based on available data the classification criteria are not met.

Component Information
2-ETHYLHEXANOL (104-76-7)

Method	Species	Exposure route	Effective dose	Exposure time	Results
OECD Test No. 408: Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat	Oral	250 mg/kg bw/d		NOAEL
OECD Test No. 408: Repeated Dose 90-Day Oral Toxicity Study in Rodents	Mouse	Oral	250 mg/kg bw/d		NOAEL
OECD Test No. 413: Sub-chronic Inhalation Toxicity: 90-day Study	Rat	Inhalation	638.4 mg/m^3		NOAEC

Aspiration hazard No information available.

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity Harmful to aquatic life with long lasting effects.

2-ETHYLHEXANOL (104-76-7)

Method	Species	Endpoint type	Effective dose	Exposure time	Results
	Leuciscus idus	LC50	17.1 mg/L	96 hours	
	Daphnia magna	EC50	39 mg/L	48 hours	
	Scenedesmus subspicatus	EC50	11.5 mg/L	72 hours	
OECD Test No. 203: Fish, Acute Toxicity Test	Pimephales promelas	LC50	28.2 mg/L	96 hours	
OECD Test No. 210: Fish, Early-Life Stage Toxicity Test	Brachydanio rerio	LC50	0.278 mg/L	30 days	
OECD Test No. 211: Daphnia magna Reproduction Test	Daphnia magna	EC10	1.53 mg/L	21 days	
	Scenedesmus subspicatus	EC50	16.6 mg/L	72 hours	
	Desmodesmus subspicatus	EC10	5.3 mg/L	72 hours	

12.2. Persistence and degradability

Persistence and degradability Readily biodegradable.

2-ETHYLHEXANOL (104-76-7)

Method	Exposure time	Value	Results
OECD Test No. 301C: Ready Biodegradability: Modified MITI Test (I) (TG 301 C)	14 days	79-99.9% Biodegradation	Readily biodegradable

12.3. Bioaccumulative potential

Bioaccumulation Not likely to bioaccumulate.

Bioconcentration factor (BCF) 20

Component Information

Chemical name	Partition coefficient
2-ETHYLHEXANOL	2.9

12.4. Mobility in soil

Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment The product does not contain any substance(s) classified as PBT or vPvB.

Chemical name	PBT and vPvB assessment
2-ETHYLHEXANOL	The substance is not PBT / vPvB

12.6. Other adverse effects

No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products Waste is classified as hazardous waste. Disposal to licensed waste disposal site in accordance with the local Waste Disposal Authority.

Contaminated packaging Do not reuse empty containers.

SECTION 14: Transport information

IATA

14.1 UN number or ID number Not regulated
14.2
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not regulated
14.5 Environmental hazards Not applicable
14.6 Special precautions for user
Special Provisions None

IMDG

14.1 UN number or ID number Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not regulated
14.5 Environmental hazards Not applicable
14.6 Special precautions for user
Special Provisions None
14.7 Maritime transport in bulk according to IMO instruments No information available

RID

14.1 UN number or ID number Not regulated
14.2 UN proper shipping name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not regulated
14.5 Environmental hazards Not applicable
14.6 Special precautions for user
Special Provisions None

ADR

14.1 UN number or ID number Not regulated
14.2 UN proper shipping name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not regulated
14.5 Environmental hazards Not applicable
14.6 Special precautions for user
Special Provisions None

SECTION 15: Regulatory information

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

National regulations

Authorisations and/or restrictions on use:
This product contains one or more substances subject to restriction (UK REACH - Annex XVII).
This product does not contain substances subject to authorisation (UK REACH - Annex XIV).

Persistent Organic Pollutants
Not applicable

Export Notification requirements

Not applicable

Named dangerous substances per COMAH Regulations 2015 (as amended)
Not applicable

The Ozone-Depleting Substances Regulations 2015
Not applicable

The Biocidal Products Regulations 2001 (as amended)
Not applicable

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended)
Not applicable

Poisons Act 1972 (Explosive Precursors) Regulations (as Amended)
Not applicable

International Inventories

TSCA	Contact supplier for inventory compliance status
DSL/NDSL	Contact supplier for inventory compliance status
EINECS/ELINCS	Contact supplier for inventory compliance status
ENCS	Contact supplier for inventory compliance status
IECSC	Contact supplier for inventory compliance status
KECI	Contact supplier for inventory compliance status
PICCS	Contact supplier for inventory compliance status
AIIC	Contact supplier for inventory compliance status
NZIoC	Contact supplier for inventory compliance status

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AIIC - Australian Inventory of Industrial Chemicals
NZIoC - New Zealand Inventory of Chemicals

15.2. Chemical safety assessment

Chemical Safety Report No information available

SECTION 16: Other information

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

Full text of H-Statements referred to under section 3
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H332 - Harmful if inhaled
H335 - May cause respiratory irritation

Legend
SVHC: Substances of Very High Concern for Authorisation:

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation
+	Sensitisers		

Revision Note ***Indicates updated data since last publication

Classification procedure	
Classification according to Regulation (EC) No. 1272/2008 [CLP]	Method Used
Acute oral toxicity	Calculation method
Acute dermal toxicity	Calculation method
Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - vapour	Calculation method
Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	Calculation method
Serious eye damage/eye irritation	Calculation method
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method
Mutagenicity	Calculation method
Carcinogenicity	Calculation method
Reproductive toxicity	Calculation method
STOT - single exposure	Calculation method
STOT - repeated exposure	Calculation method
Acute aquatic toxicity	Calculation method
Chronic aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA_RAC)
European Chemicals Agency (ECHA) (ECHA_API)
Environmental Protection Agency
Acute Exposure Guideline Level(s) (AEGL(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
National Institute of Technology and Evaluation (NITE)
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine’s PubMed database (NLM PUBMED)
U.S. National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
Organisation for Economic Co-operation and Development Screening Information Data Set
World Health Organization

Prepared By Amy Whitfield

Supercedes date 03-Jul-2018

Revision date 21-Oct-2024

This material safety data sheet complies with the requirements of UK REACH Regulations (SI 2019/758 as amended) Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Disclaimer

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

End of Safety Data Sheet

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Formulation & (re)packing of substances and mixtures
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC2 - Formulation of preparations (mixtures)
Process category(ies)	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) PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage 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 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC8 - Biocidal Products (e.g. disinfectants, pest control) PC9a - Coatings and paints, thinners, paint removers PC9b - Fillers, putties, plasters, modelling clay PC12 - Fertilisers PC13 - Fuels PC17 - Hydraulic fluids PC18 - Ink and toners PC23 - Leather tanning, dye, finishing, impregnation and care products PC24 - Lubricants, greases, release products PC27 - Plant protection products PC34 - Textile dyes, finishing and impregnating products PC35 - Washing and cleaning products (including solvent based products)
Product Name	2-Ethylhexanol
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Covers concentrations up to 100%

Amounts used

Type	Daily amount per site
Value	1467
Units	kg/d

Type	Annual amount per site
Value	440

Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor use

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Process optimised for highly efficient use of raw materials (very minimal environmental release)

Control measures to prevent releases

Air	Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber - gas removal and/or air filtration - particle removal and/or thermal oxidation and/or vapour recovery - adsorption
Water	Assumed on-site sewage treatment plant flow

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	General exposures (closed systems)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and	Wear suitable gloves tested to EN 374 Use suitable eye protection

health evaluation	Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Store substance within a closed system Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and	Assumes a good basic standard of occupational hygiene is implemented

exposure	
Assumes process temperature up to	25'C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Title	with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Title	Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Drum and small package filling
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line,

	including weighing)
Title	Drum and small package filling Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Drum and small package filling with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities with local exhaust ventilation
Covers concentrations up to	100%

Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Title	Equipment cleaning and maintenance
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Drain down system prior to equipment break-in or maintenance Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	Storage
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Store substance within a closed system Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	Storage
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Store substance within a closed system Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed

	Ensure operatives are trained to minimise exposures
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.017 mg/l	0.628
Freshwater sediment	0.171 mg/kg dw	0.628
Marine water	1.74E-3 mg/l	0.626
Marine sediment	0.017 mg/kg dw	0.626
Soil	2.64E-4 mg/kg dw	<0.01
Municipal STP	0.171 mg/l	0.017

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.217 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	6.8E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC2 - Use in closed, continuous process with occasional controlled	Worker - inhalative, long-term - local	5.426 mg/m³	0.102

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.012
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.436
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.388
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.133
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.133
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.755
PROC5 - Mixing or blending in batch	Worker - inhalative, long-term	2.713 mg/m³	0.212

processes for formulation of preparations and articles (multi-stage and/or significant contact)	- systemic		
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.331
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.331
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	3.798 mg/m³	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	3.798 mg/m³	0.071
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	15.19 mg/m³	0.286
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.416
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non	Worker - inhalative, long-term - systemic	3.798 mg/m³	0.297

dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	3.798 mg/m³	0.071
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	15.19 mg/m³	0.286
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.416
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.755
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	1.357 mg/m³	0.106
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	1.357 mg/m³	0.025
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	5.426 mg/m³	0.102
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.225
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC8b - Transfer of substance or	Worker - inhalative, long-term	2.713 mg/m³	0.051

preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	- local		
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.331
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.696
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.272
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including	Worker - inhalative, long-term - local	2.713 mg/m³	0.051

weighing)			
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.272
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.068 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.639
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.068 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.215
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	7.596 mg/m³	0.593
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	7.596 mg/m³	0.143
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual	Worker - combined, long-term - systemic		0.713

maintenance (cleaning and repair) of machinery			

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used EUSES model. Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Manufacture of substance
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC1 - Manufacture of substances
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled 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 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15 - Use as laboratory reagent
Product Name	2-Ethylhexanol
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU17 - General manufacturing

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC1 - Manufacture of substances

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 504 m3/d
Removal efficiency (total)	88%
Sludge treatment	No application of sewage sludge to soil

Further information

Operational conditions	Indoor use

Environmental factors not influenced by risk management

Local freshwater dilution factor	100
Local marine water dilution factor	100

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste or used sacks/containers according to local regulations Dispose of waste cans and containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Respiratory protection
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	with local exhaust ventilation
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust

control dispersion from source towards the worker	ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Respiratory protection
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	with local exhaust ventilation
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374

Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Respiratory protection
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	with local exhaust ventilation
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures

Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	with local exhaust ventilation
Covers concentrations up to	100%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid contact with contaminated tools and objects Clean equipment and the work area every day Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC1 - Manufacture of substances

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Marine water		0.688
Marine sediment		0.688
Soil		0.187
Municipal STP		<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic		<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local		<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local		<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic		<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic		0.424
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local		0.102
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local		0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic		0.012
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.436
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic		0.424
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local		0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local		0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic		0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.543
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - inhalative, long-term - systemic		0.424

from/to vessels/large containers at non dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local		0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local		0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic		0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.636
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic		0.248
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local		0.153
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local		0.612
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic		0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.755
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic		0.212
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local		0.051
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local		0.204
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic		0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.331
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic		0.106

PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local		0.026
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local		0.102
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic		0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.225
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic		0.636
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local		0.153
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local		0.612
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic		0.06
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.696
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic		0.212
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local		0.051
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local		0.204
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic		0.06
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.272
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic		0.212
PROC9 - Transfer of substance or preparation into small containers	Worker - inhalative, long-term - local		0.051

(dedicated filling line, including weighing)			
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local		0.204
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic		0.06
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.272
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic		0.636
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local		0.153
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local		0.612
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic		<0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.639
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic		0.212
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local		0.051
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local		0.204
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic		<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.215

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
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Section 1 - Title

Title	Use in coatings (Industrial)
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	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) PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC7 - Industrial spraying 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) PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring PROC15 - Use as laboratory reagent PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC9a - Coatings and paints, thinners, paint removers PC9b - Fillers, putties, plasters, modelling clay PC18 - Ink and toners
Product Name	2-Ethylhexanol
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Amounts used

Type	Daily amount per site
Value	200
Units	kg/d

Type	Annual amount per site
Value	60
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor use

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Control measures to prevent releases

Air	Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber - gas removal and/or air filtration - particle removal and/or thermal oxidation and/or vapour recovery - adsorption
Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Efficiency of at least 80% Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Store substance within a closed system Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and	Assumes a good basic standard of occupational hygiene is implemented

exposure	
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	Mixing operations (closed systems) Batch process
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Title	Mixing operations (open systems) Batch process with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC7 - Industrial spraying
Title	with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Assumes process temperature up to	25'C

Process category(ies)	PROC7 - Industrial spraying
Title	Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment

Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin

	See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Drum and small package filling
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Drum and small package filling with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Drum and small package filling Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection

	Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Roller, spreader, flow application Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Roller, spreader, flow application with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent	Assumes a good basic standard of occupational hygiene is implemented

/limit releases, dispersion and exposure	
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Title	with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Title	Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Title	Equipment cleaning and maintenance
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent	Assumes a good basic standard of occupational hygiene is implemented

/limit releases, dispersion and exposure	
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Drain down system prior to equipment break-in or maintenance Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Drain down system prior to equipment break-in or maintenance Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	Storage
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Organisational measures to prevent /limit releases, dispersion and exposure	Store substance within a closed system Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	8.54E-3 mg/l	0.307
Freshwater sediment	0.084 mg/kg dw	0.307
Marine water	8.5E-4 mg/l	0.306
Marine sediment	8.33E-3 mg/kg dw	0.306
Soil	6.43E-3 mg/kg dw	0.168
Municipal STP	0.081 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.033 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.033 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.13 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	4.08E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.164 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.261
PROC3 - Use in closed batch process	Worker - inhalative, long-term	9.767 mg/m³	0.763

(synthesis or formulation)	- systemic		
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	9.767 mg/m³	0.184
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	39.06 mg/m³	0.734
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.083 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.767
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.199
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC7 - Industrial spraying	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC7 - Industrial spraying	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	5.143 mg/kg bw/day	0.224
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.605
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC7 - Industrial spraying	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC7 - Industrial spraying	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	5.143 mg/kg bw/day	0.224
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.605
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC8a - Transfer of substance or	Worker - dermal, long-term -	1.645 mg/kg bw/day	0.072

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	systemic		
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.326
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	1.367 mg/m³	0.107
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	1.367 mg/m³	0.026
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	9.116 mg/m³	0.171
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.178
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.453
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072

PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.199
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.814 mg/m³	0.064
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.814 mg/m³	0.015
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	3.256 mg/m³	0.061
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.135
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.036
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.417
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.036
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including	Worker - combined, long-term - systemic		0.163

weighing)			
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.036
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.163
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	3.292 mg/kg bw/day	0.143
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.397
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	3.292 mg/kg bw/day	0.143
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.397
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	9.767 mg/m³	0.763
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	9.767 mg/m³	0.184
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	39.06 mg/m³	0.734
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.835
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.326
PROC13 - Treatment of articles by	Worker - inhalative, long-term	3.256 mg/m³	0.254

dipping and pouring	- systemic		
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.326
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	7.596 mg/m³	0.593
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	7.596 mg/m³	0.143
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.665
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.041 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.383
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.041 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.129
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.033 mg/m³	<0.01
PROC1 - Use in closed process, no	Worker - inhalative, long-term	0.033 mg/m³	<0.01

likelihood of exposure	- local		
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.13 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	4.08E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Functional fluids
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC7 - Industrial use of substances in closed systems
Process category(ies)	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) 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 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC17 - Hydraulic fluids
Product Name	2-Ethylhexanol
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC7 - Industrial use of substances in closed systems

Amounts used

Type	Daily amount per site
Value	2800
Units	kg/d

Type	Annual amount per site
Value	56
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor/Outdoor use

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d

Control measures to prevent releases

Air	Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber - gas removal and/or air filtration - particle removal and/or thermal oxidation and/or vapour recovery - adsorption
Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	General exposures (closed systems)
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Efficiency of at least 80% Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Store substance within a closed system Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems)
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	Mixing operations (closed systems) Batch process
Covers concentrations up to	25%
Physical form of product	Liquid

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Mixing operations (open systems) Batch process with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Title	with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and	Assumes a good basic standard of occupational hygiene is implemented

exposure	
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Material transfers
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Material transfers with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Material transfers Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment

Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Drum and small package filling
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Drum and small package filling with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Title	Drum and small package filling Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin

	See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	Storage
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately Store substance within a closed system
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	Storage
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately Store substance within a closed system
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC7 - Industrial use of substances in closed systems

Predicted No Effect Concentration (PNEC)

- **Freshwater** 0.017 mg/l
- **Freshwater sediment** 0.284 mg/kg dw
- **Marine water** 0.0017 mg/l
- **Marine sediment** 0.0284 mg/kg dw
- **Soil** 0.047 mg/kg dw
- **Impact on Sewage Treatment** 10 mg/l
- **Intermittent release** 0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	5.28E-3 mg/l	0.19
Freshwater sediment	0.052 mg/kg dw	0.19
Marine water	5.24E-4 mg/l	0.188
Marine sediment	5.13E-3 mg/kg dw	0.189

Soil	0.014 mg/kg dw	0.355
Municipal STP	0.049 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.033 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.033 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.13 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	4.08E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.164 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.261
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	9.767 mg/m³	0.763
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	9.767 mg/m³	0.184
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	39.06 mg/m³	0.734
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.083 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.767
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC8a - Transfer of substance or	Worker - inhalative, short-term	13.02 mg/m³	0.245

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	- local		
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.326
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.326
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.453
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at	Worker - inhalative, short-term - local	6.511 mg/m³	0.122

dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.199
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.814 mg/m³	0.064
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.814 mg/m³	0.015
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	3.256 mg/m³	0.061
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.135
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.036
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.417
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC9 - Transfer of substance or	Worker - dermal, long-term -	0.823 mg/kg bw/day	0.036

preparation into small containers (dedicated filling line, including weighing)	systemic		
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.163
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.036
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.163
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.041 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.383
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.041 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.129
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	4.558 mg/m³	0.356
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	4.558 mg/m³	0.086
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - inhalative, short-term - local	18.23 mg/m³	0.343

from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.428
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.033 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.033 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.13 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	4.08E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.164 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.261

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Washing and cleaning products
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	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) PROC7 - Industrial spraying 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 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC35 - Washing and cleaning products (including solvent based products)
Product Name	2-Ethylhexanol
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Amounts used

Type	Daily amount per site
Value	15000
Units	kg/d

Type	Annual amount per site
Value	300
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor/Outdoor use

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Control measures to prevent releases

Air	Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber - gas removal and/or air filtration - particle removal and/or thermal oxidation and/or vapour recovery - adsorption
Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	Mixing operations (closed systems) Batch process
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC7 - Industrial spraying
Title	Mixing operations (open systems) Batch process with local exhaust ventilation
Covers concentrations up to	5%
Physical form of product	Liquid

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC7 - Industrial spraying
Title	Respiratory protection
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and	Assumes a good basic standard of occupational hygiene is implemented

exposure	
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Title	Equipment cleaning and maintenance
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately Store substance within a closed system
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	Storage
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately Store substance within a closed system
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	3.01E-3 mg/l	0.108
Freshwater sediment	0.03 mg/kg dw	0.108
Marine water	2.97E-4 mg/l	0.107
Marine sediment	2.91E-3 mg/kg dw	0.107
Soil	0.032 mg/kg dw	0.839
Municipal STP	0.026 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	1.085 mg/m³	0.085
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	1.085 mg/m³	0.02
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	4.341 mg/m³	0.082
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.055 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.087
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.028 mg/kg bw/day	<0.01

PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.256
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC7 - Industrial spraying	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC7 - Industrial spraying	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	1.714 mg/kg bw/day	0.075
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.498
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	10.85 mg/m³	0.848
PROC7 - Industrial spraying	Worker - inhalative, long-term - local	10.85 mg/m³	0.204
PROC7 - Industrial spraying	Worker - inhalative, short-term - local	43.40 mg/m³	0.816
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	1.714 mg/kg bw/day	0.075
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.922
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.543
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non	Worker - combined, long-term - systemic		0.543

dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.755
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	1.357 mg/m³	0.106
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	1.357 mg/m³	0.025
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	5.426 mg/m³	0.102
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.225
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.331
PROC8a - Transfer of substance or	Worker - inhalative, long-term	10.85 mg/m³	0.848

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	- systemic		
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	10.85 mg/m³	0.204
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	43.4 mg/m³	0.816
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.967
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.217 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	6.8E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Oil field drilling and production operations
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	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) PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage 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 PROC15 - Use as laboratory reagent PROC28 - Manual maintenance (cleaning and repair) of machinery
Product Name	2-Ethylhexanol
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Amounts used

Type	Daily amount per site
Value	1000
Units	kg/d

Type	Annual amount per site
Value	200
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor use

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Control measures to prevent releases

Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems) Process sampling
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	Drilling mud (re-)formulation Use in contained systems
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Title	Preparation of material for application Mixing operations (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Title	Preparation of material for application Mixing operations (open systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers with local exhaust ventilation
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers Respiratory protection
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers Outdoor use
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin

	See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities Outdoor use
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment

Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC25 - Other hot work operations with metals
Title	Equipment cleaning and maintenance
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	Storage
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	Storage
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and	Assumes a good basic standard of occupational hygiene is implemented

exposure	
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.018 mg/l	0.642
Freshwater sediment	0.175 mg/kg dw	0.642
Marine water	1.78E-3 mg/l	0.64
Marine sediment	0.017 mg/kg dw	0.64
Soil	4.51E-5 mg/kg dw	<0.01
Municipal STP	0.174 mg/l	0.017

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.011 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.011 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.043 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	1.36E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	1.085 mg/m³	0.085
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	1.085 mg/m³	0.02
PROC2 - Use in closed, continuous	Worker - inhalative, short-term	4.341 mg/m³	0.082

process with occasional controlled exposure	- local		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.055 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.087
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.028 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.256
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.448
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	3.798 mg/m³	0.297
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	3.798 mg/m³	0.071
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	15.19 mg/m³	0.286
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.321
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424

dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.543
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.543
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.755
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	1.357 mg/m³	0.106
PROC8b - Transfer of substance or	Worker - inhalative, long-term	1.357 mg/m³	0.025

preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	- local		
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	5.426 mg/m³	0.102
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.225
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.331
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	3.798 mg/m³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	3.798 mg/m³	0.071
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	15.19 mg/m³	0.286
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.321
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC15 - Use as laboratory reagent	Worker - dermal, long-term -	0.068 mg/kg bw/day	<0.01

	systemic		
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.639
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.068 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.215
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	3.798 mg/m³	0.297
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	3.798 mg/m³	0.071
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	15.19 mg/m³	0.286
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	10.85 mg/m³	0.848
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	10.85 mg/m³	0.204
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	43.4 mg/m³	0.816
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.967
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.217 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	6.8E-3 mg/kg bw/day	<0.01

PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.427

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use as an intermediate
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Process category(ies)	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 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product Name	2-Ethylhexanol
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Amounts used

Type	Daily amount per site
Value	350
Units	kg/d

Type	Annual amount per site
Value	105
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor/Outdoor use

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d

Control measures to prevent releases

Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	General exposures (closed systems)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process
Covers concentrations up to	100%
Physical form of product	Liquid

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%

Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Title	Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Title	with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers with local exhaust ventilation

Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to

	vessels/large containers at dedicated facilities
Title	Material transfers with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Drum and small package filling
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line,

	including weighing)
Title	Drum and small package filling Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Drum and small package filling with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities with local exhaust ventilation
Covers concentrations up to	100%

Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Title	Equipment cleaning and maintenance
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	Storage
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately Store substance within a closed system
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	Storage
Covers concentrations up to	100%

Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately Store substance within a closed system
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	6.53E-3 mg/l	0.235
Freshwater sediment	0.064 mg/kg dw	0.235
Marine water	6.49E-4 mg/l	0.234
Marine sediment	6.36E-3 mg/kg dw	0.234
Soil	8.1E-3 mg/kg dw	0.212
Municipal STP	0.061 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no	Worker - inhalative, long-term	0.054 mg/m³	<0.01

likelihood of exposure	- systemic		
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.054 mg/m³	<0.1
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.217 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	6.8E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.798 mg/m³	0.297
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	3.798 mg/m³	0.071
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	15.19 mg/m³	0.286
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.012
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.309
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.388
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.133
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.133
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC4 - Use in batch and other	Worker - inhalative, short-term	32.55 mg/m³	0.612

process (synthesis) where opportunity for exposure arises	- local		
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.696
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.272
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.272
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.543
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424

dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.543
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.755
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	1.357 mg/m³	0.106
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	1.357 mg/m³	0.025
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	5.426 mg/m³	0.102
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.225
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC8b - Transfer of substance or	Worker - inhalative, long-term	2.713 mg/m³	0.051

preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	- local		
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.331
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.696
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	10.85 mg/m³	0.205
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.272
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including	Worker - inhalative, long-term - local	2.713 mg/m³	0.051

weighing)			
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.272
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.068 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.639
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.068 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.215
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	10.85 mg/m³	0.848
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	10.85 mg/m³	0.204
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	43.4 mg/m³	0.816
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual	Worker - combined, long-term - systemic		0.967

maintenance (cleaning and repair) of machinery			
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.217 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	6.8E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.012
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.436

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in process chemicals
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	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 PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage 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 PROC13 - Treatment of articles by dipping and pouring PROC15 - Use as laboratory reagent PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC23 - Leather tanning, dye, finishing, impregnation and care products PC34 - Textile dyes, finishing and impregnating products; including bleaches and other processing aids
Product Name	2-Ethylhexanol
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Amounts used

Type	Daily amount per site
Value	830
Units	kg/d

Type	Annual amount per site
Value	250
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP

Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor use

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Control measures to prevent releases

Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	General exposures (closed systems)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Assumes process temperature up to	25'C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Title	Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Title	with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Title	Preparation of material for application
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Material transfers Drum/batch transfers Bulk transfers Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent	Assumes a good basic standard of occupational hygiene is implemented

/limit releases, dispersion and exposure	
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Title	with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Title	Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Title	Equipment cleaning and maintenance
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	Storage
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately Store substance within a closed system
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	Storage
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately Store substance within a closed system
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.015 mg/l	0.535
Freshwater sediment	0.146 mg/kg dw	0.535
Marine water	1.48E-3 mg/l	0.534
Marine sediment	0.015 mg/kg dw	0.534
Soil	5.1E-3 mg/kg dw	<0.01
Municipal STP	0.145 mg/l	0.014

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m^3
Worker - inhalative, long-term - systemic	12.8 mg/m^3
Worker - inhalative, short-term - local	53.2 mg/m^3
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m^3

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio

			(RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.217 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	6.8E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.012
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.436
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.388
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.133
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.133
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC4 - Use in batch and other process (synthesis) where opportunity	Worker - inhalative, long-term - local	4.884 mg/m³	0.092

for exposure arises			
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.441
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.272
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.272
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.755
PROC8a - Transfer of substance or	Worker - inhalative, long-term	5.426 mg/m³	0.424

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	- systemic		
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.543
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.543
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	8.139	0.153
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.755
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at	Worker - inhalative, long-term - systemic	1.357 mg/m³	0.106

dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	1.357 mg/m³	0.025
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	5.426 mg/m³	0.102
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.225
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.331
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.326
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	3.256 mg/m³	0.254
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.326
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	8.139 mg/m³	0.153

PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.068 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.639
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.068 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.215
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.519 mg/m³	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	1.519 mg/m³	0.029
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.238
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.217 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	6.8E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC2 - Use in closed, continuous process with occasional controlled	Worker - inhalative, long-term - local	5.426 mg/m³	0.102

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.012
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.436

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in Lubricants
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	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) PROC10 - Roller application or brushing PROC11 - Non industrial spraying PROC13 - Treatment of articles by dipping and pouring 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, professional use but closed systems PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC24 - Lubricants, greases, release products
Product Name	2-Ethylhexanol
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Amounts used

Type	Daily amount per site
Value	15000
Units	kg/d

Type	Annual amount per site
Value	300

Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor/Outdoor use

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

Control measures to prevent releases

Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	General exposures (closed systems)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and	Wear suitable gloves tested to EN 374 Use suitable eye protection

health evaluation	Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures

	Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Title	General exposures (open systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Drum/batch transfers with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Drum/batch transfers Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95%

the worker	Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers with local exhaust ventilation
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Re-manufacture of reject articles
Covers concentrations up to	100%

Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Manual Rolling, brushing
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC11 - Non industrial spraying
Title	Spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Title	Treatment of articles by dipping and pouring with local exhaust ventilation
Covers concentrations up to	100%

Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Title	Treatment of articles by dipping and pouring Respiratory protection
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Title	Indoor use
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Title	Outdoor use
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	25'C

Process category(ies)	PROC18 - Greasing at high energy conditions
Title	Indoor use
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	100%

Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Machine
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Machine Elevated temperature
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure

Title	Storage
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	Storage
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.027 mg/l	0.961

Freshwater sediment	0.262 mg/kg dw	0.961
Marine water	2.67E-3 mg/l	0.959
Marine sediment	0.026 mg/kg dw	0.959
Soil	5.44E-5 mg/kg dw	<0.01
Municipal STP	0.263 mg/l	0.026

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.217 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	6.8E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.012
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.436
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.388
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC3 - Use in closed batch process	Worker - inhalative, short-term	6.511 mg/m³	0.122

(synthesis or formulation)	- local		
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.133
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.133
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.012
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.266
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.543
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - inhalative, short-term - local	21.70 mg/m³	0.408

from/to vessels/large containers at non dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.543
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	1.357 mg/m³	0.106
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	1.357 mg/m³	0.025
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	5.426 mg/m³	0.102
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.225
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.331
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC9 - Transfer of substance or preparation into small containers	Worker - inhalative, short-term - local	32.55 mg/m³	0.616

(dedicated filling line, including weighing)			
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.06
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.696
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.429
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	1.302 mg/m³	0.102
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	1.302 mg/m³	0.024
PROC11 - Non industrial spraying	Worker - inhalative, short-term - local	8.682 mg/m³	0.163
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.286 mg/kg bw/day	0.186
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.288
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.543
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.543
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	6.511 mg/m³	0.509
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - local	6.511 mg/m³	0.122
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, short-term - local	43.40 mg/m³	0.816
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.556

PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	3.798 mg/m³	0.297
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - local	3.798 mg/m³	0.071
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, short-term - local	15.19 mg/m³	0.286
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.344
PROC18 - Greasing at high energy conditions	Worker - inhalative, long-term - systemic	6.511 mg/m³	0.509
PROC18 - Greasing at high energy conditions	Worker - inhalative, long-term - local	6.511 mg/m³	0.122
PROC18 - Greasing at high energy conditions	Worker - inhalative, short-term - local	43.40 mg/m³	0.816
PROC18 - Greasing at high energy conditions	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC18 - Greasing at high energy conditions	Worker - combined, long-term - systemic		0.533
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - dermal, long-term - systemic	0.068 mg/kg bw/day	<0.01
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - combined, long-term - systemic		0.13
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8a - Transfer of substance or	Worker - combined, long-term		0.374

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	- systemic		
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.814 mg/m³	0.064
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.814 mg/m³	0.015
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	5.426 mg/m³	0.102
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.183
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	2.849 mg/m³	0.223
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	2.849 mg/m³	0.054
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	11.39 mg/m³	0.214
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.342
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.054 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.217 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	6.8E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC2 - Use in closed, continuous process with occasional controlled	Worker - inhalative, long-term - local	5.426 mg/m³	0.102

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.012
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.436

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in coatings (Professional)
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies)	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) PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage 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 PROC10 - Roller application or brushing PROC11 - Non industrial spraying PROC13 - Treatment of articles by dipping and pouring PROC15 - Use as laboratory reagent PROC19 - Hand-mixing with intimate contact and only PPE available PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC9a - Coatings and paints, thinners, paint removers PC9b - Fillers, putties, plasters, modelling clay PC18 - Ink and toners
Product Name	2-Ethylhexanol
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor/Outdoor use

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

Control measures to prevent releases

Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process

Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Title	Batch process
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Title	Batch process with local exhaust ventilation
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Title	Batch process Respiratory protection
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Drum/batch transfers
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Drum/batch transfers with local exhaust ventilation
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment

Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Material transfers
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Roller, spreader, flow application
Covers concentrations up to	5%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately

Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Roller, spreader, flow application with local exhaust ventilation
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Roller, spreader, flow application Respiratory protection
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC11 - Non industrial spraying
Title	Manual spraying with local exhaust ventilation
Covers concentrations up to	1%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed

	Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC11 - Non industrial spraying
Title	Manual spraying Respiratory protection
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Title	with local exhaust ventilation
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation

	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC19 - Hand-mixing with intimate contact and only PPE available
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC19 - Hand-mixing with intimate contact and only PPE available
Title	Respiratory protection
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90%

the worker	Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	3.95E-4 mg/l	0.014
Freshwater sediment	3.87E-3 mg/kg dw	0.014
Marine water	3.55E-5 mg/l	0.013
Marine sediment	3.48E-4 mg/kg dw	0.013
Soil	2.15E-5 mg/kg dw	<0.01
Municipal STP	2E-8 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.011 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.011 mg/m³	<0.01
PROC1 - Use in closed process, no	Worker - inhalative, short-term	0.043 mg/m³	<0.01

likelihood of exposure	- local		
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	1.36E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.055 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.426
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.028 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.256
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	7.597 mg/m³	0.593
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	7.597 mg/m³	0.143
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.617
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	2.17 mg/m³	0.17
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	2.17 mg/m³	0.041
PROC5 - Mixing or blending in batch processes for formulation of	Worker - inhalative, short-term - local	8.682 mg/m³	0.163

preparations and articles (multi-stage and/or significant contact)			
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.193
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	1.085 mg/m³	0.085
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	1.085 mg/m³	0.02
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	4.341 mg/m³	0.082
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.109
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.66
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - inhalative, short-term - local	21.70 mg/m³	0.408

from/to vessels/large containers at non dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.448
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	21.7 mg/m³	0.408
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.448
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	7.597 mg/m³	0.593
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	7.597 mg/m³	0.143
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.617
PROC10 - Roller application or	Worker - inhalative, long-term	8.139 mg/m³	0.636

brushing	- systemic		
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.684
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.472
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.26
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	7.597 mg/m³	0.593
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	7.597 mg/m³	0.143
PROC11 - Non industrial spraying	Worker - inhalative, short-term - local	30.38 mg/m³	0.517
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	2.143 mg/kg bw/day	0.093
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.687
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	7.597 mg/m³	0.593
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	7.597 mg/m³	0.143
PROC11 - Non industrial spraying	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.286 mg/kg bw/day	0.186
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.78
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	7.597 mg/m³	0.593
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	7.597 mg/m³	0.143
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.617

PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	2.17 mg/m³	0.17
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	2.17 mg/m³	0.041
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	8.682 mg/m³	0.163
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.193
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	3.798 mg/m³	0.297
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	3.798 mg/m³	0.071
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	15.19 mg/m³	0.286
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.297
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - dermal, long-term - systemic	5.657 mg/kg bw/day	0.246
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - combined, long-term - systemic		0.627
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.172
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - dermal, long-term - systemic	5.657 mg/kg bw/day	0.247
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - combined, long-term - systemic		373

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Functional fluids
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC9a - Wide dispersive indoor use of substances in closed systems ERC9b - Wide dispersive outdoor use of substances in closed systems
Process category(ies)	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) 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) PROC15 - Use as laboratory reagent PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC17 - Hydraulic fluids
Product Name	2-Ethylhexanol
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC9a - Wide dispersive indoor use of substances in closed systems
- ERC9b - Wide dispersive outdoor use of substances in closed systems

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor/Outdoor use

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

Control measures to prevent releases

Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	General exposures (closed systems)
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems) Respiratory protection
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems) with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Bulk transfers Drum/batch transfers
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Drum and small package filling
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC15 - Use as laboratory reagent
Title	Laboratory activities with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent	Assumes a good basic standard of occupational hygiene is implemented

/limit releases, dispersion and exposure	
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Title	with local exhaust ventilation
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and	Wear suitable gloves tested to EN 374 Use suitable eye protection

health evaluation	Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC9a - Wide dispersive indoor use of substances in closed systems - ERC9b - Wide dispersive outdoor use of substances in closed systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	7.56E-4 mg/l	0.027
Freshwater sediment	7.41E-3 mg/kg dw	0.027
Marine water	7.17E-5 mg/l	0.026
Marine sediment	7.03E-4 mg/kg dw	0.026
Soil	4.97E-4 mg/kg dw	0.013
Municipal STP	3.26E-3 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.033 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.033 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.13 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	4.08E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous	Worker - inhalative, long-term	1.628 mg/m³	0.127

process with occasional controlled exposure	- systemic		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.164 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.134
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.614 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.261
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	6.837 mg/m³	0.534
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	6.837 mg/m³	0.129
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	27.34 mg/m³	0.514
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.083 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.538
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.707
PROC9 - Transfer of substance or	Worker - inhalative, long-term	4.558 mg/m³	0.356

preparation into small containers (dedicated filling line, including weighing)	- systemic		
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	4.558 mg/m³	0.086
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	18.23 mg/m³	0.343
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.036
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.392
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.041 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.383
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.041 mg/kg bw/day	<0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.256
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, short-term - local	19.53 mg/m³	0.367
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - dermal, long-term - systemic	0.205 mg/kg bw/day	<0.01
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - combined, long-term - systemic		0.39
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - local	3.256 mg/m³	0.061

PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - dermal, long-term - systemic	0.205 mg/kg bw/day	<0.01
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - combined, long-term - systemic		0.263
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	6.836 mg/m³	0.534
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	6.836 mg/m³	0.128
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	45.56 mg/m³	0.856
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.072
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.606

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Washing and cleaning products Use in Cleaning Agents (Professional)
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies)	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 PROC10 - Roller application or brushing PROC11 - Non industrial spraying PROC13 - Treatment of articles by dipping and pouring
Product category(ies)	PC35 - Washing and cleaning products (including solvent based products)
Product Name	2-Ethylhexanol
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor/Outdoor use

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

Control measures to prevent releases

Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Title	General exposures (closed systems) Batch process
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur

	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Filling/preparation of equipment from drums or containers.
Covers concentrations up to	5%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Filling/preparation of equipment from drums or containers.
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Cleaning with low-pressure washers Rolling, brushing
Covers concentrations up to	5%
Physical form of product	Liquid

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Manual Surface cleaning Spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Ad hoc manual application via trigger sprays, dipping, etc Rolling, brushing
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC11 - Non industrial spraying
Title	Cleaning with high-pressure washers Spraying Indoor use
Covers concentrations up to	5%

Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC11 - Non industrial spraying
Title	Manual Surface cleaning Spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC11 - Non industrial spraying
Title	Ad hoc manual application via trigger sprays, dipping, etc Rolling, brushing
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Title	Manual Surface cleaning Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Physical form of product	Liquid

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	3.95E-4 mg/l	0.014
Freshwater sediment	3.87E-3 mg/kg dw	0.014
Marine water	3.55E-5 mg/l	0.013
Marine sediment	3.48E-4 mg/kg dw	0.013
Soil	2.14E-5 mg/kg dw	<0.01
Municipal STP	1.2E-8 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC2 - Use in closed, continuous	Worker - inhalative, long-term	5.426 mg/m³	0.102

process with occasional controlled exposure	- local		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.055 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.426
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	3.256 mg/m³	0.061
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.028 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.256
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	7.597 mg/m³	0.593
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	7.597 mg/m³	0.143
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.012
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.605
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	1.139 mg/m³	0.089
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	1.139 mg/m³	0.021
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	7.597 mg/m³	0.143
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.113
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	4.558 mg/m³	0.356

PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	4.558 mg/m³	0.086
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.38
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	1.139 mg/m³	0.089
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	1.139 mg/m³	0.021
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	7.597 mg/m³	0.143
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.137
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	1.899 mg/m³	0.148
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	1.899 mg/m³	0.036
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	7.597 mg/m³	0.143
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.196
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	1.139 mg/m³	0.089
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	1.139 mg/m³	0.021
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	7.597 mg/m³	0.143
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.137
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	0.76 mg/m³	0.059
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	0.76 mg/m³	0.014
PROC11 - Non industrial spraying	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.286 mg/kg bw/day	0.186
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.246
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	0.76 mg/m³	0.059
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	0.76 mg/m³	0.014

PROC11 - Non industrial spraying	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.286 mg/kg bw/day	0.186
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.246
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	0.38 mg/m³	0.03
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	0.38 mg/m³	<0.01
PROC11 - Non industrial spraying	Worker - inhalative, short-term - local	15.19 mg/m³	0.286
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.286 mg/kg bw/day	0.186
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.216
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.76 mg/m³	0.059
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	0.76 mg/m³	0.014
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.083

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in agrochemicals
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage 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 PROC11 - Non industrial spraying PROC13 - Treatment of articles by dipping and pouring PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC12 - Fertilisers PC27 - Plant protection products
Product Name	2-Ethylhexanol
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor/Outdoor use

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

Control measures to prevent releases

Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs

	followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC11 - Non industrial spraying
Title	Manual spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC11 - Non industrial spraying
Title	Spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Title	Ad hoc manual application via trigger sprays, dipping, etc
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures

	Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Title	Respiratory protection
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	4.23E-4 mg/l	0.015
Freshwater sediment	4.15E-3 mg/kg dw	0.015
Marine water	3.84E-5 mg/l	0.014
Marine sediment	3.76E-4 mg/kg dw	0.014
Soil	5.94E-5 mg/kg dw	<0.01
Municipal STP	2.88E-4 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	4.558 mg/m³	0.356
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	4.558 mg/m³	0.086
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.38
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	1.139 mg/m³	0.089
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non	Worker - inhalative, long-term - local	1.139 mg/m³	0.021

dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	7.597 mg/m³	0.143
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.113
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	1.519 mg/m³	0.119
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	1.519 mg/m³	0.029
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.143
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	4.558 mg/m³	0.356
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	4.558 mg/m³	0.086
PROC11 - Non industrial spraying	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.286 mg/kg bw/day	0.186
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.542
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	4.558 mg/m³	0.356
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	4.558 mg/m³	0.086
PROC11 - Non industrial spraying	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.286 mg/kg bw/day	0.186
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.542
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	7.597 mg/m³	0.593
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	7.597 mg/m³	0.143
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024

PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.617
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	8.139 mg/m³	0.636
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	8.139 mg/m³	0.153
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.66
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	2.713 mg/m³	0.212
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	2.713 mg/m³	0.051
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.236

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in Lubricants
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies)	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) PROC10 - Roller application or brushing PROC11 - Non industrial spraying PROC13 - Treatment of articles by dipping and pouring 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, professional use but closed systems PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC24 - Lubricants, greases, release products
Product Name	2-Ethylhexanol
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Further information

Operational conditions	Indoor/Outdoor use

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

Control measures to prevent releases

Water	Assumed on-site sewage treatment plant flow
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)

Title	General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin Wear suitable coveralls to prevent exposure to the skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Title	General exposures (open systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Provide extract ventilation to points where emissions occur Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Title	Filling/preparation of equipment from drums or containers.
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Bulk transfers
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 95% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Filling/preparation of equipment from drums or containers.
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Title	Indoor use
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent	Assumes a good basic standard of occupational hygiene is implemented

/limit releases, dispersion and exposure	
Assumes process temperature up to	25'C

Process category(ies)	PROC18 - Greasing at high energy conditions
Title	Indoor use
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Title	Outdoor use
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Equipment cleaning and maintenance
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately

Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Equipment cleaning and maintenance Elevated temperature
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Title	Engine lubricant service
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation

	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Manual
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC11 - Non industrial spraying
Title	Spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Provide a basic standard of general ventilation (1 to 3 air changes per hour)

control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Process category(ies)	PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Title	Operation of equipment containing engine oils and similar General exposures (closed systems)
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Assumes process temperature up to	25'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	4.07E-4 mg/l	0.015
Freshwater sediment	3.99E-3 mg/kg dw	0.015

Marine water	3.67E-5 mg/l	0.013
Marine sediment	3.6E-4 mg/kg dw	0.013
Soil	3.73E-5 mg/kg dw	<0.01
Municipal STP	1.2E-4 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.011 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.011 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.043 mg/m³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	1.36E-3 mg/kg bw/day	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	5.426 mg/m³	0.424
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	5.426 mg/m³	0.102
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.055 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.426
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	2.279 mg/m³	0.178
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	2.279 mg/m³	0.043
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	9.116 mg/m³	0.171
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.028 mg/kg bw/day	<0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.179
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	3.256 mg/m³	0.254
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	3.256 mg/m³	0.061

PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	13.02 mg/m³	0.245
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.012
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.266
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.405
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	4.558 mg/m³	0.356
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	4.558 mg/m³	0.086
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	30.38 mg/m³	0.517
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.38
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	4.558 mg/m³	0.356
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	4.558 mg/m³	0.086
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	30.38 mg/m³	0.571

PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.38
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	6.511 mg/m³	0.509
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - local	6.511 mg/m³	0.122
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, short-term - local	43.40 mg/m³	0.816
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.556
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	3.798 mg/m³	0.297
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - local	3.798 mg/m³	0.071
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, short-term - local	15.19 mg/m³	0.286
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.344
PROC18 - Greasing at high energy conditions	Worker - inhalative, long-term - systemic	6.511 mg/m³	0.509
PROC18 - Greasing at high energy conditions	Worker - inhalative, long-term - local	6.511 mg/m³	0.122
PROC18 - Greasing at high energy conditions	Worker - inhalative, short-term - local	43.40 mg/m³	0.816
PROC18 - Greasing at high energy conditions	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.24
PROC18 - Greasing at high energy conditions	Worker - combined, long-term - systemic		0.533
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	7.597 mg/m³	0.593
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	7.597 mg/m³	0.143
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.617
PROC8b - Transfer of substance or preparation (charging/discharging)	Worker - inhalative, long-term - systemic	1.085 mg/m³	0.085

from/to vessels/large containers at dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	1.085 mg/m³	0.02
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	21.70 mg/m³	0.408
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.11 mg/kg bw/day	<0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.09
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.543 mg/m³	0.042
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	0.543 mg/m³	0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	10.85 mg/m³	0.204
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.066
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	7.597 mg/m³	0.593
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	7.597 mg/m³	0.143
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	30.38 mg/m³	0.571
PROC9 - Transfer of substance or	Worker - dermal, long-term -	0.274 mg/kg bw/day	0.012

preparation into small containers (dedicated filling line, including weighing)	systemic		
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.605
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	4.884 mg/m³	0.382
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	4.884 mg/m³	0.092
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	32.55 mg/m³	0.612
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.048
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.429
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	1.302 mg/m³	0.102
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	1.302 mg/m³	0.024
PROC11 - Non industrial spraying	Worker - inhalative, short-term - local	8.682 mg/m³	0.163
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.286 mg/kg bw/day	0.186
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.288
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	2.17 mg/m³	0.17
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	2.17 mg/m³	0.041
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	8.682 mg/m³	0.163
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.024
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.193
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - systemic	1.628 mg/m³	0.127
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - local	1.628 mg/m³	0.031
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, short-term - local	6.511 mg/m³	0.122
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - dermal, long-term - systemic	0.068 mg/kg bw/day	<0.01
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - combined, long-term - systemic		0.13

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is

required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in Lubricants
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage 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
Product category(ies)	PC24 - Lubricants, greases, release products
Product Name	2-Ethylhexanol
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Amounts used

Type	Annual amount used in the EU
Value	2500
Units	t(ons)/year

Other operational conditions of use affecting environmental exposure

Emission days	365
Release fraction to air from process (initial release prior to RMM)	100%
Release fraction to wastewater from process (initial release prior to RMM)	100%
Release fraction to soil from process (initial release prior to RMM)	20%

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure	
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	20'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	20'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Conditions and measures related to personal protection, hygiene and	Wear a respirator providing a minimum efficiency of 90% Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee

health evaluation	training Efficiency of at least 80% Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	20'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used ECETOC TRA model

Remarks Risk from environmental exposure is driven by freshwater Risk from environmental exposure is driven by freshwater sediment

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater Freshwater sediment	2.1 kg/d	0.651913

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	3.255 mg/m³	0.254297
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	3.255 mg/m³	0.061184
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	1.6457 mg/kg bw/day	0.071553
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	8.1375 mg/m³	0.635742
PROC8a - Transfer of substance or	Worker - inhalative, long-term	8.1375 mg/m³	0.1252961

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	- local		
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.6457 mg/kg bw/day	0.071553
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	3.255 mg/m³	0.254297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	3.255 mg/m³	0.061184
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.6457 mg/kg bw/day	0.071553

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). For scaling see. http:/www.ecetoc.org/tra.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Formulation
Type	Consumer
Main user group	Consumer uses: Private households (= general public = consumers)
Environmental release category(ies)	ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Product category(ies)	PC8 - Biocidal Products (e.g. disinfectants, pest control) PC13 - Fuels
Product Name	2-Ethylhexanol
Sector(s) of use	SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Amounts used

Type	Annual amount used in the EU
Value	500
Units	t(ons)/year

Other operational conditions of use affecting environmental exposure

Emission days	365
Release fraction to air from process (initial release prior to RMM)	100%
Release fraction to wastewater from process (initial release prior to RMM)	100%
Release fraction to soil from process (initial release prior to RMM)	20%

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	2000 m3/d

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
Local freshwater dilution factor	10
Local marine water dilution factor	100

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of consumer exposure	
Product categories [PC]	PC8 - Biocidal Products (e.g. disinfectants, pest control)
Covers concentrations up to	25%
Vapour pressure	93 Pa
Amounts used	0.02 g Amount per use
Exposure duration	1.33 minutes
Use frequency	24 times per year
Release area	20 cm2
Assumes process temperature up to	20'C

Product categories [PC]	PC13 - Fuels
Covers concentrations up to	25%
Vapour pressure	93 Pa
Amounts used	0.02 g Amount per use
Exposure duration	1.33 minutes
Use frequency	24 times per year
Release area	20 cm2
Assumes process temperature up to	20'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used ECETOC TRA model

Remarks Risk from environmental exposure is driven by freshwater sediment

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater sediment	1 mg/d	0.271594

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Calculation method The Consexpo model has been used to estimate consumer exposures unless otherwise indicated

Product category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PC8 - Biocidal Products (e.g. disinfectants, pest control)	Consumer - dermal, long-term - systemic	0.0055 mg/kg bw/day	0.000481
PC8 - Biocidal Products (e.g. disinfectants, pest control)	Consumer - inhalative, long-term - systemic	0.001 mg/m³	0.000433
PC13 - Fuels	Consumer - dermal, long-term - systemic	0.0055 mg/kg bw/day	0.000481
PC13 - Fuels	Consumer - inhalative, long-term - systemic	0.001 mg/m³	0.000433

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model. For scaling see. http:/www.ecetoc.org/tra.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	2-Ethylhexanol
Pure substance/mixture	Substance
REACH registration number	01-2119487289-20-XXXX
CAS No	104-76-7
EC No (EU Index No)	203-234-3
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Plant protection agent
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Specific Environmental Release Category	ECPA SPERC 8d.2.v1
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC11 - Non industrial spraying
Product Name	2-Ethylhexanol
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems
Specific Environmental Release Category - ECPA SPERC 8d.2.v1

Amounts used

Type	Annual amount per site
Value	0.00025
Units	t(ons)/year

Other operational conditions of use affecting environmental exposure

Emission days	1

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste cans and containers according to local regulations This material and its container must be disposed of as hazardous waste Dispose of waste or used sacks/containers according to local regulations

Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	20'C

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	20'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Filling/preparation of equipment from drums or containers.
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	25'C

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Title	Indoor use
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	25'C

Process category(ies)	PROC18 - Greasing at high energy conditions
Title	Indoor use
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	25'C

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Title	Outdoor use
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Equipment cleaning and maintenance
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed

	Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Title	Equipment cleaning and maintenance Elevated temperature
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Title	Engine lubricant service
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC10 - Roller application or brushing
Title	Manual
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC11 - Non industrial spraying
Title	Spraying
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and	Wear suitable gloves tested to EN 374 Use suitable eye protection

health evaluation	Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Title	Operation of equipment containing engine oils and similar General exposures (closed systems)
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90% Handle substance within a predominantly closed system provided with extract ventilation Supervision in place to check that the RMMs in place are being used correctly and OCs followed Ensure operatives are trained to minimise exposures Regular inspection and maintenance of equipment and machines Clear spills immediately
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 Use suitable eye protection Avoid contact with eyes and skin See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor
Assumes process temperature up to	25'C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	93 Pa

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	20'C

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	93 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	20'C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems - ERC8d - Wide dispersive outdoor use of processing aids in open systems
Specific Environmental Release Category - ECPA SPERC 8d.2.v1

Predicted No Effect Concentration (PNEC)

Freshwater	0.017 mg/l
Freshwater sediment	0.284 mg/kg dw
Marine water	0.0017 mg/l
Marine sediment	0.0284 mg/kg dw
Soil	0.047 mg/kg dw
Impact on Sewage Treatment	10 mg/l
Intermittent release	0.17 mg/l

Calculation method Used ECETOC TRA model
Remarks Risk from environmental exposure is driven by freshwater

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater sediment	0.302 kg/ha	0.99

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	23 mg/kg bw/day
Worker - inhalative, long-term - local	53.2 mg/m³
Worker - inhalative, long-term - systemic	12.8 mg/m³
Worker - inhalative, short-term - local	53.2 mg/m³
Consumer - oral, long-term - systemic	1.1 mg/kg bw/day
Consumer - dermal, long-term - systemic	11.4 mg/kg bw/day
Consumer - inhalative, long-term - systemic	2.3 mg/m³

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.7 mg/m³	0.054687
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	0.7 mg/m³	0.013158
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non	Worker - dermal, long-term - systemic	8.57 mg/kg bw/day	0.372609

dedicated facilities			
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	0.01 mg/m³	0.000781
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	0.01 mg/m³	0.000188
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	2.9 mg/kg bw/day	0.126087
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.008 mg/m³	0.000625
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	0.008 mg/m³	0.00015
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	4.39 mg/kg bw/day	0.19087
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	5.25 mg/m³	0.410156
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	5.25 mg/m³	0.098684
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	0.866 mg/kg bw/day	0.037652

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Used ECETOC TRA model. For scaling see. http:/www.ecetoc.org/tra.