SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
Regulation (EC) No. 1907/2006 as amended by Regulation (EU) No. 2020/878, and
Regulation (EC) No. 1272/2008

Supercedes date 06-Feb-2026 **Revision date** 25-Aug-2026 **Revision Number** 4.1

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

1.1. Product identifier

Product Name Methanol; Bio methanol

Other means of identification

Chemical name	CAS No.	EC / List No.	Index No.	REACH registration number
Methanol	67-56-1	200-659-6	603-001-00-X	Methanex Europe SA/NV: 01-2119433307-44-0031 Methanex Fuels Europe BV: 01-2119433307-44-0271

Synonyms Methyl alcohol, wood alcohol, methyl hydroxide

Substance/mixture Substance

Molecular weight 32.04 g/mol

Other information Chemical Family - Alcohols

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

Recommended use Industrial use, Professional use, Consumer use:

Solvent
Fuels
Raw material
Cleaning agent
Laboratory reagent
Use in oil and gas field drilling and production operations
Water treatment chemicals, wastewater
Consumer use of cleaning agents and de-icers

Uses advised against None known

1.3. Details of the supplier of the safety data sheet

Supplier
Methanex Europe SA/NV
Waterloo Office Park - Building C
Drève Richelle 161 - C
B-1410 Waterloo
Belgium
Phone: +(32) 2 352 06 70

Methanex Fuels Europe BV
Willemsparkweg 193
1071 HA Amsterdam
Netherlands
Phone: +31 6 21 44 67 45

For further information, please contact

E-mail address Methanex Europe SA/NV: reach@methanex.com
Methanex Fuels Europe BV: EUlogistics@methanex.com

1.4. Emergency telephone number

Emergency telephone Chemical Emergency Line: +44 (0) 1235 239 670 (24h/7d)

Emergency telephone - §45 - (EC)1272/2008	
Europe	**112**
Belgium	Belgian Poison Centre: 070 245 245 (French and Dutch)
Croatia	Croatian Institute of Public Health, Division for Toxicology: +38514686910 (Monday-Friday, 8:00 - 15:00 local time)
Denmark	Danish Poison Center (Giftlinjen): +45 8212 1212 Chemical Emergency Line: +45 8988 2286
France	ORFILA – Poison Control Centers : +33 (0)1 45 42 59 59 Chemical Emergency Line: +33 1 72 11 00 03
Germany	Chemical Emergency Line: +49 89 220 61012, 0800 000 7801 (toll-free, access from Germany only)
Greece	(0030) 2107793777 (24 hours per day, 7 days per week) Chemical Emergency Line: +30 21 1198 3182
Hungary	Health Toxicological Information Service in Hungary (ETTSZ): +36 80 20 11 99
Italy	National Toxicology Information Center: +39 0382/26261 Chemical Emergency Line: 800 699 792 Centro Antiveleni di Milano 02 66101029 (CAV Ospedale Niguarda Ca` Granda - Milano) Centro Antiveleni di Pavia 0382 24444 (CAV IRCCS Fondazione Maugeri - Pavia) Centro Antiveleni di Bergamo 800 883300 (CAV Ospedali Riuniti - Bergamo) Centro Antiveleni di Firenze 055 7947819 (CAV Ospedale Careggi - Firenze) Centro Antiveleni di Roma 06 3054343 (CAV Policlinico Gemelli - Roma) Centro Antiveleni di Roma 06 49978000 (CAV Policlinico Umberto I - Roma) Centro Antiveleni di Roma 06 68593726 (CAV Ospedale Pediatrico Bambino Gesù - Roma) Centro Antiveleni di Napoli 081 5453333(CAV Ospedale Cardarelli - Napoli) Centro Antiveleni di Foggia 800183459 (CAV Azienda Ospedaliera Universitaria - Foggia) Centro Antiveleni di Verona 800011858 (CAV Azienda Ospedaliera Integrata - Verona)
Netherlands	Nationaal Vergiftigingen Informatie Centrum (NVIC): +31 (0)30 2748888 – Only for the purpose of informing medical personnel in cases of acute intoxications Chemical Emergency Line: +31 10 713 8195
Poland	Chemical Emergency Line: +48 22 307 3690
Portugal	Portuguese Poison Center (CIAV): 808 250 143 (24 hours/365 days) Chemical Emergency Line: +351 30880 4750
Romania	International Health Regulations and Toxicological Information Office: 021.318.36.06 (direct) (Monday to Friday, between 8:00 and 15:00, local time)
Spain	National Toxicology Information Centre (SIT): +34 (0)91 562 04 20 (24 hours/365 days) Chemical Emergency Line: +34 91 114 2520
Sweden	112 – ask for Poisons Information Chemical Emergency Line: +46 8 566 42573
Switzerland	145

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flammable liquids	Category 2 - (H225)
Acute toxicity - Oral	Category 3 - (H301)
Acute toxicity - Dermal	Category 3 - (H311)
Acute toxicity - Inhalation (Vapours)	Category 3 - (H331)
Specific target organ toxicity (single exposure)	Category 1 - (H370)

2.2. Label elements

Contains Methanol

Signal word

Danger

Hazard statements

H301 - Toxic if swallowed.
H311 - Toxic in contact with skin.
H331 - Toxic if inhaled.
H370 - Causes damage to organs.
H225 - Highly flammable liquid and vapour.

Precautionary statements

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 - Do not breathe dust, fume, gas, mist, vapors and spray.
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor.
P321 - Specific treatment (see supplemental first aid instructions on this label).
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
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. This product requires child resistant fastenings if supplied to the general public.

2.3. Other hazards

Other hazards Risk of blindness after swallowing the product. Harmful to aquatic life.

PBT or vPvB properties None known.

Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors.

SECTION 3: Composition/information on ingredients

3.1. Substances

Chemical name	Weight-%	REACH registration number	EC No. (Index No.)	Classification according to Regulation (EC) No. 1272/2008 [CLP]	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)	Notes
Methanol 67-56-1	100	Methanex Europe SA/NV: 01-2119433307-44-0031 Methanex Fuels Europe BV:	200-659-6	Acute Tox. 3 (H301) Acute Tox. 3 (H311) Acute Tox. 3 (H331) STOT SE 1 (H370) Flam. Liq. 2 (H225)	STOT SE 1 :: C>=10% STOT SE 2 :: 3%<=C<10%	-	-	-

		01-2119433307-44-0271						

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

Acute Toxicity Estimate
If LD50/LC50 data is not available or does not correspond to the classification category, then the appropriate conversion value from CLP Annex I, Table 3.1.2, is used to calculate the acute toxicity estimate (ATEmix) for classifying a mixture based on its components

Chemical name	Oral LD50 mg/kg	Dermal LD50 mg/kg	Inhalation LC50 - 4 hour - dust/mist - mg/L	Inhalation LC50 - 4 hour - vapour - mg/L	Inhalation LC50 - 4 hour - gas - ppm
Methanol 67-56-1	100	300	No data available	3	No data available

This product does not contain candidate substances of very high concern at a concentration >=0.1% (Regulation (EC) No. 1907/2006 (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. Immediate medical attention is required.

Inhalation Remove to fresh air. IF exposed or concerned: Get medical advice and attention. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Get immediate medical attention.

Skin contact Remove/Take off immediately all contaminated clothing. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical attention.

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

Self-protection of the first aider Remove all sources of ignition. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Use personal protective equipment as required. See section 8 for more information. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Do not breathe vapour or mist.

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

Symptoms Exposure may cause nausea, weakness and central nervous system effects, headache, vomiting, dizziness, symptoms of drunkenness. Coma and death due to respiratory failure may follow severe exposures: Medical treatment necessary. A latent period of several hours may occur between exposure and the onset of symptoms. Coughing and/ or

wheezing. Difficulty in breathing.

Effects of Exposure Causes damage to organs: Eyes.

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

Note to doctors The severity of outcome following methanol ingestion may be more related to the time between ingestion and treatment, rather than the amount ingested; therefore, there is a need for rapid treatment of any ingestion exposure. Call a Poison Center. Antidote: Fomepizole enhances elimination of metabolic formic acid. Antidote should be administered by qualified medical personnel.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media Use water spray to cool fire-exposed containers. Water will not cool methanol below its flash point. Dry chemical. Carbon dioxide (CO_2). Water spray. Alcohol resistant foam or alcohol resistant fluorine free foams.

Unsuitable extinguishing media No information available.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical Mixtures >20% methanol with water: flammable. Highly flammable liquid and vapour. Vapours are heavier than air and may spread along floors. Risk of ignition. Keep product and empty container away from heat and sources of ignition. In the event of fire, cool tanks with water spray. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Hazardous combustion products Toxic gases or vapours. Carbon monoxide. Carbon dioxide (CO_2). Formaldehyde.

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters Methanol: Burns with invisible flame. Flame may not be visible in daylight. Cool containers with flooding quantities of water until well after fire is out. Fires need to be assessed to determine appropriate protocols and safety measures for firefighting, including establishing safe zones, extinguishing media to be used, firefighter protection, and actions to control or extinguish the fire. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Evacuate personnel to safe areas. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Do not breathe vapour or mist.

Other information Ventilate the area. 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

Avoid release to the environment. Dispose of contents/containers in accordance with local regulations. Biodegradable at low concentrations. Soluble in water. When released, this product is expected to evaporate. Contact authorities in the event of pollution of soil and aquatic environment or discharge into drains. Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.

6.3. Methods and material for containment and cleaning up

Methods for containment

Stop leak if you can do it without risk. Do not touch or walk through spilled material. A vapour suppressing foam may be used to reduce vapours. Dyke far ahead of spill to collect run-off water. Keep out of drains, sewers, ditches and waterways. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

Methods for cleaning up

Small spill: Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use non-sparking tools. Collect spillage. Large spill: Take precautionary measures against static discharges. Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labelled containers.

Prevention of secondary hazards

Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections

Safe handling: see Section 7. Personal protection equipment (PPE): see Section 8. Disposal: see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Do not enter confined area unless adequately ventilated. Use personal protective equipment. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use grounding and bonding connection when transferring this material to prevent static discharge, fire or explosion. Use spark-proof tools and explosion-proof equipment. Keep in an area equipped with sprinklers. Use according to package label instructions. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Take off contaminated clothing and wash it before reuse. Do not breathe vapour or mist. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product.

General hygiene considerations

Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes or clothing. Wear protective gloves, eye protection and face protection. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Do not breathe vapour or mist.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions

Keep unauthorised personnel away. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Keep in properly labelled containers. Do not store near combustible materials. Keep in an area equipped with sprinklers. Store in accordance with the particular national regulations. Store in accordance with local regulations. Keep out of the reach of children. Store locked up.

Storage class (TRGS 510) LGK 3.

7.3. Specific end use(s)

Specific use(s) Formulation & (re)packing of substances and mixtures Distribution of formulations. Use as an intermediate. Use as a Process chemical Distribution of substance. Use as a Fuel (use in industrial settings). Use in Cleaning Agents (use in industrial settings). Use as laboratory reagent/agent (use in industrial settings). Use as wastewater treatment chemical (use in industrial settings). Use in Oilfield drilling and production operations (use in industrial settings). Use as a Fuel (use in professional settings). Use in Cleaning Agents (use in professional settings). Use as laboratory reagent/agent (use in professional settings). Use in Cleaning Agents Use in De-icing and Anti-icing agents (consumer use) (spray products). Use in Cleaning Agents Use in De-icing and Anti-icing agents (consumer use) (liquid products). Use as Fuel additive (consumer use) (outdoor use).

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical name	European Union (Directives 98/24/EC and 2004/37/EC)
Methanol 67-56-1	TWA: 200 ppm; TWA: 260 mg/m^3; pSk

Chemical name	Austria (GKV BGBl. II Nr. 330/2024)	Belgium (Royal Decree 21/01/2020)	Bulgaria (Regulation No 13)	Croatia (Official Gazette No. 91/2018)
Methanol 67-56-1	TWA-TMW: 200 ppm; TWA-TMW: 260 mg/m^3; STEL-KZGW: 800 ppm (4 X 15 min); STEL-KZGW: 1040 mg/m^3 (4 X 15 min); Sk	TWA: 200 ppm; TWA: 266 mg/m^3; STEL: 250 ppm; STEL: 333 mg/m^3; Sd	TWA: 200 ppm; TWA: 260.0 mg/m^3; Sk	TWA-GVI: 200 ppm; TWA-GVI: 260 mg/m^3; Sk

Chemical name	Cyprus (Cabinet of Ministers Regulation 268/2001)	Czech Republic (Regulation 361/2007)	Denmark (BEK no. 1619 of 19/12/2024)	Estonia (Regulation No. 105)
Methanol 67-56-1	TWA: 200 ppm; TWA: 260 mg/m^3; pSk	TWA: 250 mg/m^3; Ceiling: 1000 mg/m^3; pSk	TWA: 200 ppm; TWA: 260 mg/m^3; STEL: 400 ppm; STEL: 520 mg/m^3; pSk	TWA: 200 ppm; TWA: 250 mg/m^3; STEL: 250 ppm; STEL: 350 mg/m^3; Sk

Chemical name	Finland (HTP-ARVOT 2025)	France (INRS ED 6443)	Germany (TRGS 900)	Germany (DFG)
Methanol 67-56-1	TWA: 200 ppm; TWA: 270 mg/m^3; STEL: 250 ppm; STEL: 330 mg/m^3; pSk	TWA-VME (restrictif): 2 00 ppm; TWA-VME (restrictif): 2 60 mg/m^3; STEL-VLCT (restrictif): 1000 ppm; STEL-VLCT (restrictif): 1300 mg/m^3; dSk	TWA-AGW; 100 ppm (2(II)); TWA-AGW; 130 mg/m^3 (2(II)); Sk	TWA-MAK: 100 ppm; II(2); TWA-MAK: 130 mg/m^3; II(2); Sk

Chemical name	Greece (Presidential Decrees 90/1999, 338/2001 and 212/2006)	Hungary (5/2020 ITM Decree)	Italy (Legislative Decree no. 81)	Italy (AIDII)
Methanol 67-56-1	TWA: 200 ppm; TWA: 260 mg/m^3;	TWA-AK: 260 mg/m^3; TWA-AK: 200 ppm;	TWA: 200 ppm; TWA: 260 mg/m^3;	TWA: 200 ppm; TWA: 262 mg/m^3;

	STEL: 250 ppm; STEL: 325 mg/m^3; pSk	pSk	pSk	STEL (REL): 250 ppm; STEL (REL): 328 mg/m^3; pSk
Chemical name	Ireland (CoP 2024)	Latvia (Cabinet of Ministers Regulation No. 325)	Lithuania (HN 23:2011)	Luxembourg (A-N°684)
Methanol 67-56-1	TWA: 200 ppm; TWA: 260 mg/m^3; STEL: 600 ppm (calculated); STEL: 780 mg/m^3 (calculated); pSk	TWA: 200 ppm; TWA: 260 mg/m^3; pSk	TWA-IPRD: 200 ppm; TWA-IPRD: 260 mg/m^3; Sk	TWA: 200 ppm; TWA: 260 mg/m^3; pSk
Chemical name	Malta (Subsidiary Legislation 424.24)	Netherlands (Working Conditions Regulations)	Norway (FOR-2011-12-06-1358)	Poland (Legislative Journal 2018 item 1286)
Methanol 67-56-1	TWA: 200 ppm; TWA: 260 mg/m^3; pSk	TWA: 100 ppm; TWA: 133 mg/m^3; Sk	TWA: 100 ppm; TWA: 130 mg/m^3; STEL: 150 ppm (value calculated); STEL: 162.5 mg/m^3 (value calculated); Sk	TWA-NDS: 100 mg/m^3; STEL-NDSCh: 300 mg/m^3; Prohibited - substances or mixtures containing Methanol in weight concentration >3%;except fuels used in the model building, powerboating, fuel cells and biofuels Sk
Chemical name	Portugal (NP 1796:2014)	Romania (Government Decision no. 1218/2006)	Slovakia (Gov. Decree 122/2024)	Slovenia (Regulations 100/2001 and 29/2024)
Methanol 67-56-1	TWA (VLE-MP): 200 ppm; TWA (VLE-MP): 260 mg/m^3; STEL (VLE-CD): 250 ppm; pSk	TWA: 200 ppm; TWA: 260 mg/m^3; Sk	TWA: 200 ppm; TWA: 260 mg/m^3; pSk	TWA: 200 ppm; TWA: 260 mg/m^3; STEL: 800 ppm; STEL: 1040 mg/m^3; pSk

Chemical name	Spain (Occupational exposure limits for chemical agents in Spain, 2025)	Sweden (AFS 2023:14)	Switzerland (MAK values)
Methanol 67-56-1	TWA-(VLA-ED): 200 ppm; TWA-(VLA-ED): 266 mg/m^3; pSk	TLV-NGV: 200 ppm; TLV-NGV: 250 mg/m^3; STEL (Vägledande KGV): 250 ppm; STEL (Vägledande KGV): 350 mg/m^3; Sk	TWA-MAK: 200 ppm; TWA-MAK: 260 mg/m^3; STEL-KZGW: 400 ppm; STEL-KZGW: 520 mg/m^3; Sk

Note See section 16 for terms and abbreviations

Other information on limit values OEL values in accordance with Commission Directive 2000/39/EC of 8 June 2003, as amended, establishing a first list of indicative occupational exposure limit values in the implementation of Council Directive 98/24/EC

Biological occupational exposure limits

Chemical name	European Union (Directive 98/24/EC)	Austria (VGÜ 2008)	Bulgaria (Regulation No 13)	Croatia (Official Gazette No. 91/2018)	Czech Republic (Decree Nos. 181/2015 and 240/2015)
Methanol	-	-	-	7.0 mg/g Creatinine	0.47 mmol/L (urine -

67-56-1				- urine (Methanol) - at the end of the work shift	Methanol end of shift) 15 mg/L (urine - Methanol end of shift)
Chemical name	Denmark (BEK no. 1619 of 19/12/2024)	Finland (HTP-ARVOT 2025)	France (Decree 2009-157)	Germany (DFG)	Germany (TRGS 903)
Methanol 67-56-1	-	-	- urine (Methanol) - end of shift	15 mg/L - BAT (end of exposure or end of shift) urine	15 mg/L (urine - Methanol at the end of the shift, in case of long-term exposure after several previous shifts)
Chemical name	Greece (Presidential Decrees 90/1999 and 212/2006)	Hungary (5/2020 ITM Decree)	Ireland (CoP 2024)	Italy (Legislative Decree no. 81)	Italy (AIDII)
Methanol 67-56-1	-	30 mg/L (urine - Methanol end of shift) 940 µmol/L (urine - Methanol end of shift)	15 mg/L (urine - Methanol end of shift)	-	15 mg/L - urine (Methanol) - end of shift

Chemical name	Latvia (Cabinet of Ministers Regulation No. 325)	Luxembourg (A-N°684)	Romania (Government Decision no. 1218/2006)	Slovakia (Gov. Decree 122/2024)
Methanol 67-56-1	-	-	6 mg/L - urine (Methanol) - end of shift	15 mg/L (urine - Methanol end of exposure or work shift) 15 mg/L (urine - Methanol after all work shifts)

Chemical name	Slovenia (Regulation No 100/2001)	Spain (Occupational exposure limits for chemical agents in Spain, 2025)	Switzerland (BAT values)
Methanol 67-56-1	15 mg/L - urine (Methanol) - at the end of the work shift; for long-term exposure: at the end of the work shift after several consecutive workdays	15 mg/L (urine - Methanol end of shift)	30 mg/L (urine - Methanol end of shift, and after several shifts (for long-term exposures)) 936 µmol/L (urine - Methanol end of shift, and after several shifts (for long-term exposures))

Derived No Effect Level (DNEL) - Workers

Chemical name	Oral	Dermal	Inhalation
Methanol 67-56-1	-	20 mg/kg bw/day [4] [6] 20 mg/kg bw/day [4] [7]	130 mg/m^3 [4] [6] 130 mg/m^3 [4] [7] 130 mg/m^3 [5] [6] 130 mg/m^3 [5] [7]

Notes

[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
Methanol 67-56-1	4 mg/kg bw/day [4] [6] 4 mg/kg bw/day [4] [7]	4 mg/kg bw/day [4] [6] 4 mg/kg bw/day [4] [7]	26 mg/m^3 [4] [6] 26 mg/m^3 [4] [7] 26 mg/m^3 [5] [6] 26 mg/m^3 [5] [7]

Notes

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

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

8.2. Exposure controls

Engineering controls Provide local exhaust ventilation. Handle product only in closed system or provide appropriate exhaust ventilation. All equipment used when handling the product must be grounded.

Personal protective equipment

Eye/face protection Tight sealing safety goggles. Eye protection must conform to standard EN 166.

Hand protection Wear suitable gloves. Impervious gloves. Gloves must conform to standard EN 374.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron. (EN ISO 6529). Antistatic boots.

Respiratory protection Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode. Use a properly fitted, air-purifying or supplied air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator (EN 137).

General advice PPE assigned in accordance with Council Directive 89/656/EEC of 30 November 1989, as amended, concerning the minimum safety and health requirements for the use by workers of personal protective equipment at the workplace.

Environmental exposure controls Avoid release to the environment. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Clear liquid
Physical state	Liquid
Colour	Clear
Odour	Alcohol
Odour threshold	4.2 - 5960 ppm

Property	Values	Remarks • Method
Melting point / freezing point	-97.8 °C	No data available

Boiling point or initial boiling point and boiling range	64.7 °C	No data available
Flammability		No data available
Lower and upper explosion limit/flammability limit		
Lower explosion limit	5.5%	No data available
Upper explosion limit	36.5%	No data available
Flash point	11 °C	No data available
Autoignition temperature	464 °C	No data available
Decomposition temperature		No data available
SADT (°C)		No data available
pH		No data available
pH (as aqueous solution)		No data available
Kinematic viscosity		No data available
Dynamic viscosity	0.8 cP	@ 20 °C
Water solubility	1E-3 g/L @ 20 °C	Miscible
Solubility		No data available
Partition coefficient n-octanol/water (log value)	-0.77	log Pow
Vapour pressure	169.2 hPa	@ 25 °C
Density and/or relative density	0.791 - 0.793	@ 20 °C
Bulk density		No data available
Liquid Density		No data available
Relative vapour density	1.1	@ 20 °C (air = 1)
Particle characteristics		
Particle Size		No data available
Particle Size Distribution		No data available

9.2. Other information

Molecular weight	32.04 g/mol
VOC content	100%
Softening point	No information available
Evaporation rate	4.1 Butyl acetate = 1
Henry's Law Constant	0.461 Pa m^3/mol @ 20°C

9.2.1. Information with regards to physical hazard classes

Explosives

Explosive properties	Vapours may form explosive mixtures with air
Oxidising properties	No information available

9.2.2. Other safety characteristics

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity Containers may rupture or explode if exposed to heat.

10.2. Chemical stability

Stability May form flammable/explosive vapour-air mixture.

Explosion data

Sensitivity to mechanical impact	None.
Sensitivity to static discharge	Yes.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions None under normal processing.

10.4. Conditions to avoid

Conditions to avoid Containers may rupture or explode if exposed to heat. Heat, flames and sparks. Excessive heat.

10.5. Incompatible materials

Incompatible materials Lead. Aluminium. Zinc. Oxidising agent. Strong acids. Strong bases. Polyethylene. Polyvinyl chloride (PVC). Nitriles.

10.6. Hazardous decomposition products

Hazardous decomposition products Carbon monoxide. Carbon dioxide (CO2). Formaldehyde.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Information on likely routes of exposure

Product Information

Inhalation Toxic by inhalation.

Eye contact May cause irritation.

Skin contact Toxic in contact with skin.

Ingestion Toxic if swallowed. MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Exposure may cause nausea, weakness and central nervous system effects, headache, vomiting, dizziness, symptoms of drunkenness. Coma and death due to respiratory failure may follow severe exposures: Medical treatment necessary. A latent period of several hours may occur between exposure and the onset of symptoms. Coughing and/ or wheezing. Difficulty in breathing.

Acute toxicity Toxic if swallowed. Toxic in contact with skin. Toxic by inhalation.

Numerical measures of toxicity Acute Toxicity Estimate (ATE) values provided as a reflection of the hazard classification. The acute toxicity of methanol varies greatly species to species and has been well documented. Methanol's toxicity is driven by its metabolism and the creation of toxic metabolites. Metabolism within animal species utilized for acute toxicity testing is not an accurate representation of human metabolism. Therefore, positive human evidence outweighs rat and rabbit toxicity values. Animal toxicity values are reported below, but are not appropriate for human health hazard classification.

ATEmix (oral)	100 mg/kg
ATEmix (dermal)	300 mg/kg
ATEmix (inhalation-vapour)	3 mg/L

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Methanol	= 6200 mg/kg (Rat)	= 15840 mg/kg (Rabbit)	= 22500 ppm (Rat) 8 h = 64000 ppm (Rat) 4 h

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

Skin corrosion/irritation Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation May cause mild to moderate irritation.

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

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

Carcinogenicity Contains no ingredient listed as a carcinogen.

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

STOT - single exposure
Causes damage to the following organs: Optic nerve.

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

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

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Endocrine disruption for human health Based on available data, the classification criteria are not met.

11.2.2. Other information

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity Avoid release to the environment.

Aquatic toxicity

Component Information

Chemical name	Fish	Crustacea	Algae/aquatic plants	Toxicity to microorganisms
Methanol	LC50: =28200mg/L (96h, Pimephales promelas) LC50: >100mg/L (96h, Pimephales promelas) LC50: 19500 - 20700mg/L (96h, Oncorhynchus mykiss) LC50: 18 - 20mL/L (96h, Oncorhynchus mykiss)	-	-	-

	LC50: 13500 - 17600mg/L (96h, Lepomis macrochirus)			

Terrestrial toxicity

Component Information

Chemical name	Earthworm	Avian	Honeybees
Methanol	Acute Toxicity: LC50 > 1 mg/cm2 (Eisenia foetida, 48 h filter paper)	-	-

12.2. Persistence and degradability Readily biodegradable.

12.3. Bioaccumulative potential Not expected to bioaccumulate.

Component Information

Chemical name	Partition coefficient	Bioconcentration factor (BCF)	Trophic magnification factor (TMF)
Methanol	-0.77	10	-

12.4. Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

Chemical name	PBT and vPvB assessment
Methanol	Not PBT/vPvB

12.6. Endocrine disrupting properties Based on available data, the classification criteria are not met.

12.7. Other adverse effects No information available.

PMT or vPvM properties Based on available data, the classification criteria are not met.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products Do not allow into any sewer, on the ground or into any body of water. Should not be released into the environment. Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Recover or recycle if possible. Empty containers pose a potential fire and explosion hazard. Do not cut, puncture or weld containers.

Waste codes / waste designations according to EWC / AVV Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. 07 01 04*.

Other information	Waste disposal according to directive 2008/98/EC, as amended, covering waste and dangerous waste.

SECTION 14: Transport information

IATA

14.1 UN number or ID number	UN1230
14.2 UN proper shipping name	Methanol
14.3 Transport hazard class(es)	3
Subsidiary hazard class	6.1
14.4 Packing group	II
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	A113
ERG Code	3L
Description	UN1230, Methanol, 3 (6.1), II

IMDG

14.1 UN number or ID number	UN1230
14.2 UN proper shipping name	METHANOL
14.3 Transport hazard class(es)	3
Subsidiary hazard class	6.1
14.4 Packing group	II
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	279
EmS-No.	F-E, S-D
Description	UN1230, METHANOL, 3 (6.1), II, (11°C C.C.)
14.7 Maritime transport in bulk according to IMO instruments	No information available

RID

14.1 UN number or ID number	UN1230
14.2 UN proper shipping name	METHANOL
14.3 Transport hazard class(es)	3
Subsidiary hazard class	6.1
14.4 Packing group	II
Description	UN1230, METHANOL, 3 (6.1), II
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	None
Classification code	FT1

ADR

14.1 UN number or ID number	UN1230
14.2 UN proper shipping name	METHANOL
14.3 Transport hazard class(es)	3
Subsidiary hazard class	6.1
14.4 Packing group	II
Description	UN1230, METHANOL, 3 (6.1), II
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	279
Classification code	FT1
Tunnel restriction code	(D/E)

ADN

14.1 UN number or ID number	UN1230
14.2 UN proper shipping name	METHANOL
14.3 Transport hazard class(es)	3
Subsidiary hazard class	6.1
14.4 Packing group	II
Description	UN1230, METHANOL, 3 (6.1), II
14.5 Environmental hazard	Not applicable
14.6 Special precautions for user	
Special Provisions	279, 802
Classification code	FT1
Ventilation	VE01, VE02
Equipment Requirements	PP, EP, EX, TOX, A

SECTION 15: Regulatory information

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

National regulations

France

Occupational Illnesses (R-463-3, France)

Chemical name	French RG number
Methanol 67-56-1	RG 84

Germany

Water hazard class (WGK) obviously hazardous to water (WGK 2)

Chemical Prohibition Ordinance (ChemVerbotsV) This product is subject to requirements and restrictions regarding handling and delivery.

TA Luft (German Air Pollution Control Regulation)
Class NK (Nicht Kassifiziert-Not Classified) **Technical Share of Air (%)** No information available

Chemical name	Number	Class
Methanol 67-56-1	5.2.5	Class I

TRGS 905 Not applicable

Netherlands

Water contaminating class (Netherlands)
Carcinogenic, mutagenic and reproductive toxic effects

Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Mutagens	Netherlands - List of Reproductive Toxins
Methanol 67-56-1	-	-	-

Switzerland

Ordinance on the Incentive Tax on Volatile Organic Compounds (OVOC) SR 814.018 Group I

Storage of Hazardous Material SC 6.1

WPO (GSchV) SR 814.201; WPA (GSchG) SR 814.20 Class A

Major Accidents Ordinance SR 814.012

Chemical name	Threshold quantity
Methanol 67-56-1	20000 kg

Ordinance on Protection against Dangerous Substances and Preparations Chemicals Ordinance, ChemO Not applicable

European Union

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.

Take note of Directive 94/33/EC on the protection of young people at work
Take note of Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work

Take note of Directive 92/85/EC on the protection of pregnant and breastfeeding women at work

Authorisations and/or restrictions on use:
This product contains one or more substance(s) subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII). This product does not contain substances subject to authorisation (Regulation (EC) No. 1907/2006 (REACH), Annex XIV).

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
Methanol 67-56-1	Item 69 Item 75	-

Persistent Organic Pollutants Regulation (EU) 2019/1021
Not applicable.

Dangerous substance category per Seveso Directive (2012/18/EU)
H2 - ACUTE TOXIC
H3 - STOT SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE
P5a - FLAMMABLE LIQUIDS
P5b - FLAMMABLE LIQUIDS
P5c - FLAMMABLE LIQUIDS

Named dangerous substances per Seveso Directive (2012/18/EU)

Chemical name	Lower-tier requirements (tons)	Upper-tier requirements (tons)
Methanol 67-56-1	500	5000

Ozone-depleting substances (ODS) regulation (EC) 2024/590
Not applicable.

EU - Plant Protection Products (1107/2009/EC) Not applicable

Biocidal Products Regulation (EU) No 528/2012 (BPR) Not applicable

EU - Water Framework Directive (2000/60/EC) Not applicable

EU - Environmental Quality Standards (2008/105/EC) Not applicable

Explosives Precursors Marketing and Use (2019/1148)
Not applicable.

International Inventories

TSCA	Listed
DSL/NDSL	Listed on DSL.
EINECS/ELINCS	Listed.
ENCS	Listed.
IECSC	Listed.
KECI	Listed.
PICCS	Listed.
AIIC	Listed.
NZIoC	Complies.
TCSI	Listed.

15.2. Chemical safety assessment

Chemical Safety Report	A Chemical Safety Assessment has been carried out for this substance. Date of most recent Chemical Safety Report: 2026-05-11.

SECTION 16: Other information

Full text of any hazard and/or precautionary statements referred to under Sections 2-15
H225 - Highly flammable liquid and vapour
H301 - Toxic if swallowed
H311 - Toxic in contact with skin
H331 - Toxic if inhaled
H370 - Causes damage to organs
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor
P321 - Specific treatment (see supplemental first aid instructions on this label)
P330 - Rinse mouth
P405 - Store locked up
P501 - Dispose of contents and container in accordance with local, regional, national, and international regulations as applicable
P280 - Wear protective gloves, protective clothing, eye protection and face protection
P302 + P352 - IF ON SKIN: Wash with plenty of water and soap
P312 - Call a POISON CENTER or doctor if you feel unwell
P321 - Specific treatment (see supplemental instructions on the administration of antidotes on this label)
P361 + P364 - Take off immediately all contaminated clothing and wash it before reuse
P261 - Avoid breathing dust, fume, gas, mist, vapors and spray
P271 - Use only outdoors or in a well-ventilated area
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P311 - Call a POISON CENTER or doctor
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P260 - Do not breathe dust, fume, gas, mist, vapors and spray
P308 + P311 - IF exposed or concerned: Call a POISON CENTER or doctor
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P233 - Keep container tightly closed
P240 - Ground and bond container and receiving equipment
P241 - Use explosion-proof electrical, ventilating and lighting equipment
P242 - Use non-sparking tools
P243 - Take action to prevent static discharges
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish
P403 + P235 - Store in a well-ventilated place. Keep cool

Key or legend to abbreviations and acronyms used in the safety data sheet
List may include phrases which are not applicable to this product

ACGIH	American Conference of Governmental Industrial Hygienists
AIDII	Italian Association of Industrial Hygienists
ADN	Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (Europe)
ADR	Agreement concerning the International Carriage of Dangerous Goods by Road (Europe)
AIIC	Australian Inventory of Industrial Chemicals
ATE	Acute Toxicity Estimate
ASTM	American Society for the Testing of Materials
bar	Biological Reference Values for Chemical Compounds in the Work Area
BAT	Biological tolerance values for occupational exposure
BEL	Biological exposure limits
bw	Body weight
Ceiling	Maximum limit value
CLP	Classification, Labelling and Packaging Regulation; Regulation (EC) No 1272/2008
CMR	Carcinogen, Mutagen or Reproductive Toxicant
DFG	German Research Foundation
DOT	Department of Transportation (United States)
DSL	Domestic Substances List (Canada)
ECHA	European Chemicals Agency
EC Number	European Community number
EINECS	European Inventory of Existing Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
ENCS	Existing and New Chemical Substances (Japan)
EPA	U.S. Environmental Protection Agency
EWC	European Waste Codes
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBC	International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
ICAO	International Civil Aviation Organisation
IECSC	Inventory of Existing Chemical Substances in China
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
ISO	International Organisation for Standardisation
KECI	Korean Existing Chemicals Inventory
LC50	Lethal Concentration to 50% of a test population
LD50	Lethal Dose to 50% of a test population (Median Lethal Dose)
MAK	Maximum Concentration at the Workplace
MAL	Measuring Technical Hygienic Air Needs
MARPOL	International Convention for the Prevention of Pollution from Ships
MDLPS	Ministry of Labour and Social Policy
NDSL	Non-Domestic Substances List (Canada)
n.o.s.	Not Otherwise Specified
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No Observed Adverse Effect Level
NOELR	No Observable Effect Loading Rate
NZIoC	New Zealand Inventory of Chemicals
OECD	Organization for Economic Cooperation and Development
OEL	Occupational exposure limits
PBT	Persistent, Bioaccumulative and Toxic substance
PICCS	Philippines Inventory of Chemicals and Chemical Substances

PMT	Persistent, Mobile and Toxic
PPE	Personal protective equipment
QSAR	Quantitative Structure Activity Relationship
REACH	Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH) Regulation (EC 1907/2006)
RID	Agreement concerning the International Carriage of Dangerous Goods by Rail (Europe)
SADT	Self-Accelerating Decomposition Temperature
SAR	Structure-activity relationship
SDS	Safety Data Sheet
SL	Surface Limit
STEL	Short Term Exposure Limit
STOT RE	Specific target organ toxicity - Repeated exposure
STOT SE	Specific target organ toxicity - Single exposure
SVHC	Substance of very high concern
TCSI	Taiwan Chemical Substance Inventory
TDG	Transport of Dangerous Goods (Canada)
TRGS	Technical Rule for Hazardous Substances
TSCA	Toxic Substances Control Act (United States)
TWA	Time-Weighted Average
UN	United Nations
VOC	Volatile organic compounds
vPvB	Very Persistent and Very Bioaccumulative
vPvM	Very Persistent and Very Mobile
As	Allergenic substance
C	Carcinogen
DS	Dermal Sensitizer
Ot	Ototoxicant
pOt	Ototoxicant - potential to cause hearing disorders
PS	Photosensitiser
RS	Respiratory Sensitiser
S	Sensitiser
poS	Sensitizer - capable of causing occupational asthma
Sa	Simple asphyxiant
Sd	Skin designation
pSd	Skin designation - potential for cutaneous absorption
Sdv	Skin designation - vacated
Sk	Skin notation
dSk	Skin notation - danger of cutaneous absorption
pSk	Skin notation - potential for cutaneous absorption

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
Chronic aquatic toxicity	Calculation method

Acute aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method

Key literature references and sources for data used to compile the SDS
U.S. 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)
U.S. Environmental Protection Agency
U.S. EPA 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
U.S. Hazardous Substance Data Bank (HSDB)
International Uniform Chemical Information Database (IUCLID)
Japan GHS Classification
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
U.S. National Institute for Occupational Safety and Health (NIOSH)
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)
International Organization for Economic Co-operation and Development (OECD) Environment, Health, and Safety Publications
International Organization for Economic Co-operation and Development (OECD) High Production Volume Chemicals Program
International Organization for Economic Co-operation and Development (OECD) Screening Information Data Set
United Nations World Health Organization (WHO)

Limit Value Legal Basis

European Union (Directive 98/24/EC)	Council Directive 98/24/EC of April 7, 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work, as amended
European Union (Directive 2004/37/EC)	Directive 2004/37/EC of April 29, 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work, as amended
Austria (GKV BGBl. II Nr. 330/2024)	Ordinance on Limit Values for Workplace Substances and on Carcinogens, as amended by BGBl. II Nr. 330/2024, from the Federal Ministry of Economics and Labor
Austria (VGÜ 2008)	Ordinance on health monitoring at the workplace 2008, published through BGBl. II Nr. 224/2007 by Austria Minister for Labor and Social Affairs, as amended
Belgium (Royal Decree 21/01/2020)	Royal Decree of March 11, 2002 on the protection of workers' health against risks from chemical agents at work, as amended
Bulgaria (Regulation No 13)	Regulation No. 13 of December 30, 2003 on the Protection of Workers from Hazards Related to Exposure to Chemical Agents at Work, as amended
Bulgaria (Regulation No 10)	Regulation No. 10 of September 26, 2003 on the Protection of Workers from the Risks Associated with Exposure to Carcinogens, Mutagens or Substances Toxic to Reproduction at Work, as amended
Croatia (Official Gazette No. 91/2018)	Official Gazette No. 91/2018 on the Protection of Workers from Exposure to Hazardous Chemicals at Work, the Limit Values of Exposure and the Biological Limit Values, as amended
Cyprus (Cabinet of Ministers Regulation 268/2001)	Cabinet of Ministers Regulation 268/2001 - Safety and Health in the Working Environment (Chemical Substances), as amended
Cyprus (Cabinet of Ministers Regulation 153/2001)	Cabinet of Ministers Regulation 153/2001 - Safety and Health in the Working Environment (Chemical Substances-Carcinogens), as amended
Czech Republic (Regulation 361/2007)	Conditions for the Protection of the Health of Employees at Work, Government Regulation 361/2007, as amended
Czech Republic (Decree Nos. 181/2015 and 240/2015)	Decree 181/2015 and Decree 240/2015, amending Decree No. 432/2003 Coll., laying down the conditions for the application of the work into categories, limit values for the parameters of biological exposure tests and requirements for reporting work with asbestos and biological agents
Denmark (BEK no. 1619 of	Statutory Order No. 507, Order on Limit Values for Substances and Materials, as amended

19/12/2024)	by BEK no. 1619 of 19/12/2024
Estonia (Regulation No. 105)	Health and Safety Requirements for the Use of Dangerous Chemicals and Materials Containing Them and Occupational Exposure Limits to Chemical Agents, Regulation No. 105 of March 20, 2001, as amended
Finland (HTP-ARVOT 2025)	Regulation on Concentrations Known to be Hazardous, 55/2025, Publications of Ministry of Social Affairs and Health
France (INRS ED 6443)	Occupational Exposure Limit Values, ED 6443, Published 2021 by the INRS (the National Research and Safety Institute for the Prevention of Occupational Accidents and Diseases), as amended
France (Decree 2009-157)	Decree 2009-1570 of December 15, 2009, relative to the control of chemical risk on workplaces
Germany (TRGS 900)	TRGS 900 - Occupational Exposure Limits, Technical Rules for Dangerous Substances, 2025
Germany (TRGS 903)	Biological Threshold Limits (BGW-Values), Technical Rules for Dangerous Substances, 2025
Germany (DFG)	MAK and BAT values of Hazardous Chemical Compounds in the Work Area, published by the German Research Foundation on July 1, 2025
Greece (Presidential Decree 90/1999)	Presidential Decree 90/1999, Occupational Exposure Limits - Protection of workers' health and safety from exposure to certain chemical substances during the workday, as amended
Greece (Presidential Decree 212/2006)	Presidential Decree 212/2006, Protection of workers that are exposed to asbestos
Greece (Presidential Decree 338/2001)	Presidential Decree 338/2001, Protection of workers' health and safety from exposure to certain chemical substances during the workday
Hungary (5/2020 ITM Decree)	5/2020. (II. 6.) Ministry of Innovation and Technology decree on the protection of the health and safety of workers from the risks related to chemical agents, as amended
Ireland (CoP 2024)	2024 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations (2001-2021) & the Safety, Health and Welfare at Work (Carcinogens, Mutagens and Reprotoxic Substances) Regulations (2024)
Italy (Legislative Decree no. 81)	Title IX, Annex XLIII and XXXVIII, Professional Exposure Limits and Annex XXXIX Mandatory Biological Limit Values and Health Monitoring, Legislative Decree no. 81 of April 9, 2008, as amended
Italy (AIDII)	Final Note (1), Ministerial Decree of August 20, 1999 by the Ministry of Health along with the Ministry of Industry, Trade, and Arts
Latvia (Cabinet of Ministers Regulation No. 325)	Cabinet of Ministers Regulation No. 325 of 2007 - Labor Protection Requirements when Coming in Contact with Chemical Substances at Workplaces, as amended
Lithuania (HN 23:2011)	Lithuanian Hygiene Standard HN 23:2011 Occupational Exposure limit values for chemical substances - General requirements of measurement and impact assessment, as amended
Luxembourg (A-N°684)	Grand-Ducal Regulation of 20 July 2018 amending the Grand-Ducal Regulation of 14 November 2016 concerning the protection of the safety and health of employees against the risks associated with chemical agents in the workplace, A-N°684 of 2018
Malta (Subsidiary Legislation 424.24)	Malta Occupational Health and Safety Authority Act: Chapter 424 - Protection of the health and safety of workers from the risks related to chemical agents at work, as amended
Netherlands (Working Conditions Regulations)	Occupational Working Conditions Regulation, Limit Values for substances harmful to health, Annex XIII, as amended
Norway (FOR-2011-12-06-1358)	Regulations concerning action and limit values for physical and chemical agents in the working environment and classified biological agents, as amended
Poland (Legislative Journal 2018 item 1286)	Regulation of the Minister of Family, Labor and Social Policy of June 12, 2018 on the Highest Allowable Concentrations and Intensities of Factors Harmful to Health in the Work Environment, as amended
Portugal (NP 1796:2014)	Portuguese Norm NP 1796:2014, Occupational exposure limits and biological exposure indices to chemical agents, Table 1 - Occupational exposure limits and biological exposure indices to chemical agents (OELs)
Romania (Government Decision no. 1218/2006)	Governmental Decision No. 1218 from September 6, 2006 on the minimum health and safety requirements for protection of workers from the risks related to exposure to chemical agents, Annex No. 1 Mandatory National Occupational Exposure Limit Values for Chemical Agents
Slovakia (Gov. Decree 122/2024)	Government Decree of Slovak Republic 122/2024 of May 22, 2024 amending Government Decree of Slovak Republic 355/2006 about protection of health of employees when working with chemical agents

Slovenia (Regulation No 100/2001)	Regulation for protection of workers against risks related to exposure to chemical substances at the workplace, Annexes I and II, the Official Gazette of the Republic of Slovenia, No. 100/2001, as amended
Slovenia (Regulation No 29/2024)	Regulation for protection of workers against risks related to carcinogenic, mutagenic or reprotoxic substances exposure at work, Annex III, The Official Journal of the Republic of Slovenia, No. 29/2024, as amended
Spain (Occupational exposure limits for chemical agents in Spain, 2025)	National Institute for Safety and Health at Work (INSST) - Occupational exposure limits for chemical agents in Spain, 2025, Tables 1 and 3
Sweden (AFS 2023:14)	The Swedish Work Environment Authority's Regulations and General Advice on Respiratory limit values in the work Environment
Switzerland (MAK values)	Occupational Limit Values 2025, Swiss National Accident Insurance Fund, List of MAK Values
Switzerland (BAT values)	Occupational Limit Values 2025, Swiss National Accident Insurance Fund, List of Biological Limit Values

Issuing Date 12-Sep-2016

Supercedes date 06-Feb-2026

Revision date 25-Aug-2026

Revision Note Supplier information. Name change. SDS sections updated: 1, 15, 16.

Training Advice Adequate training is required before industrial or professional use.

Disclaimer

The information above is believed to be accurate and represents the best information currently available to us. Users should make their own investigations to determine the suitability of the information for their particular purposes. This document is intended as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Methanex Corporation and its subsidiaries make no representations or warranties, either express or implied, including without limitation any warranties of merchantability, fitness for a particular purpose with respect to the information set forth herein or the product to which the information refers. Accordingly, Methanex Corp. will not be responsible for damages resulting from use of or reliance upon this information.

End of Safety Data Sheet

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

Product Name Methanol; Bio methanol
Substance/mixture Substance
REACH registration number 01-2119433307-44-0031
EC No. (Index No.) 200-659-6
CAS No. 67-56-1

Chemical name Methanol

Identified uses

Exposure scenario	Product categories [PC]	Sector of uses [SU]	Process categories [PROC]	Article categories [AC]	Environmental release categories [ERC]
ES01: Manufacture of substance	-	-	PROC1 PROC2 PROC3 PROC4 PROC5 PROC8a PROC8b PROC9 PROC15	-	ERC1
ES02 Formulation & (re)packing of substances and mixtures Distribution of formulations	PC0	-	PROC1 PROC2 PROC3 PROC4 PROC5 PROC8a PROC8b PROC9 PROC15	-	ERC2
ES03 Use as an intermediate End use Industrial	PC0	-	PROC1 PROC2 PROC3 PROC4 PROC8a PROC8b PROC15	-	ERC6a
ES04 Use as a Process chemical Distribution of substance End use Industrial	PC0	-	PROC1 PROC2 PROC3 PROC4 PROC8a PROC8b PROC9 PROC15	-	ERC4
ES05 Use as a Fuel (use in industrial settings) End use Industrial	PC13	-	PROC1 PROC2 PROC3 PROC8a PROC8b PROC16 PROC19	-	ERC7
ES06 Use in Cleaning Agents (use in industrial settings) End use Industrial	PC0	-	PROC1 PROC2 PROC3 PROC4 PROC7 PROC8a	-	ERC4

			PROC8b PROC10 PROC13		
ES07 Use as laboratory reagent/agent (use in industrial settings) End use Industrial	PC21	-	PROC10 PROC15	-	ERC4
ES08 Use as wastewater treatment chemical (use in industrial settings) End use Industrial	PC37	-	PROC2	-	ERC4
ES09 Use in Oilfield drilling and production operations (use in industrial settings) End use Industrial	PC41	-	PROC4 PROC5 PROC8a PROC8b	-	ERC7
ES10 Use as a Fuel (use in professional settings) End use Professional	PC13	-	PROC1 PROC2 PROC3 PROC8a PROC8b PROC16 PROC19	-	ERC9a ERC9b
ES11 Use in Cleaning Agents (use in professional settings) End use Professional	PC0	-	PROC1 PROC2 PROC3 PROC4 PROC8a PROC8b PROC10 PROC11 PROC13	-	ERC8a ERC8d
ES12 Use as laboratory reagent/agent (use in professional settings) End use Professional	PC21	-	PROC10 PROC15	-	ERC8a
ES13 Use in Cleaning Agents Use in De-icing and Anti-icing agents (consumer use) (spray products) End use Consumer	PC4 PC35	-	-	-	ERC8a ERC8d
ES14 Use in Cleaning Agents Use in De-icing and Anti-icing agents (consumer use) (liquid products) End use Consumer	PC4 PC35	-	-	-	ERC8a ERC8d
ES15	PC13	-	-	-	ERC9b

Use as Fuel additive (consumer use) (outdoor use) End use Consumer					

Exposure scenario

ES01 - Manufacture of substance

Section 1 - Title

Title	ES01 - Manufacture of substance
Environmental release category(ies)	- ERC1 - Manufacture of substances
Specific Environmental Release Category	- ESVOC SpERC 1.1.v3
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 - PROC15 - Use as laboratory reagent

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC1 - Manufacture of substances
Specific Environmental Release Category - ESVOC SpERC 1.1.v3

Amounts used	
Value	= 2E3
Units	t(ons)/day
Remarks	Daily use amount at site

Value	100%
Remarks	Daily use amount at site Percentage of EU tonnage used at regional scale

Value	100%
Remarks	Percentage of Regional tonnage used at local scale

Value	= 2.5E5
Units	t(ons)/year
Remarks	Annual use amount at site

Product characteristics	
Physical form of product	Liquid
Vapour pressure	12.8 kPa
Temperature vapour pressure	20°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process	5%, 1E5 kg/day

(initial release prior to RMM)	
Release fraction to wastewater from process (initial release prior to RMM)	0.2%, 4E3 kg/day
Release fraction to soil from process (initial release prior to RMM)	1E-3%, -kg/day
Release fraction to soil from wide dispersive use (regional only)	0.2%
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Sludge treatment	Application of the STP sludge on agricultural soil: No
Remarks	Biological STP: Site specific: Effectiveness Water: 87.38% Discharge rate of STP: = 2E3 m^3/day

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor; RMM limiting release to water: The release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m3/day

Waste management	
Air	0.124%
Water	12.61%
Remarks	Sludge: 9.44E-3% Degraded: 87.25%

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors All unrecovered waste is handled as an industrial waste that can be incinerated

Section 2.2 - Control of worker exposure

Control of worker exposure	
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** **PROC15 - Use as laboratory reagent**

Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	12.8 kPa
Temperature vapour pressure	20°C
Level of dustiness	High
Volatility	High
Exposure duration	> 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed PROC1 PROC3 PROC15 240 cm² PROC2 PROC4 480 cm² PROC8a PROC8b 960 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC1 No specific measures identified PROC2 PROC3 PROC4 PROC8a PROC8b PROC15 Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC1 Respiratory protection not applicable Hand protection not applicable PROC2 PROC3 PROC4 PROC8a PROC8b PROC15 Respiratory protection not applicable Gloves APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Operational conditions	Industrial

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SpERC 1.1.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term

Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³
Man via the environment - Oral - Systemic	4 mg/kg bw/d
Man via the environment - Inhalation - Systemic	26 mg/m³

Man via the environment - Inhalation - Local	26 mg/m³
Derived No Effect Level (DNEL)	**Short term**
Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³

Calculation method	EasyTRA
Exposure route	Worker - all relevant routes

Exposure estimation				
Process category(ies)	**Exposure route**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PROC1	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, long-term - systemic	130 mg/m³	0.013351 mg/m³	0.000103
PROC1	Worker - combined, long-term - systemic	-	0.036193 mg/kg bw/d	0.001817
PROC1	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, short-term - systemic	130 mg/m³	0.053403 mg/m³	0.000411
PROC1	Worker - combined, short-term - systemic	-	0.041915 mg/kg bw/d	0.002125
PROC2	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, long-term - systemic	130 mg/m³	3.338 mg/m³	0.025675
PROC2	Worker - combined, long-term - systemic	-	0.7511 mg/kg bw/d	0.039389
PROC2	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC2	Worker - combined, short-term - systemic	-	2.182 mg/kg bw/d	0.116413
PROC3	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.051349
PROC3	Worker - combined, long-term - systemic	-	1.091 mg/kg bw/d	0.058206
PROC3	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, short-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC3	Worker - combined, short-term - systemic	-	3.952 mg/kg bw/d	0.212254
PROC4	Worker - dermal, long-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC4	Worker - inhalative, long-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC4	Worker - combined, long-term - systemic	-	3.279 mg/kg bw/d	0.17127
PROC4	Worker - dermal, short-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC4	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC4	Worker - combined, short-term - systemic	-	9 mg/kg bw/d	0.479365

PROC8a	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC8a	Worker - combined, long-term - systemic	-	7.511 mg/kg bw/d	0.393889
PROC8a	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC8a	Worker - combined, short-term - systemic	-	12.279 mg/kg bw/d	0.650635
PROC8b	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, long-term - systemic	130 mg/m³	10.013 mg/m³	0.077024
PROC8b	Worker - combined, long-term - systemic	-	4.173 mg/kg bw/d	0.214167
PROC8b	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, short-term - systemic	130 mg/m³	20.026 mg/m³	0.154048
PROC8b	Worker - combined, short-term - systemic	-	5.604 mg/kg bw/d	0.29119
PROC15	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.051349
PROC15	Worker - combined, long-term - systemic	-	1.022 mg/kg bw/d	0.054778
PROC15	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC15	Worker - combined, short-term - systemic	-	1.976 mg/kg bw/d	0.106127

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
-	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	9.527 mg/m³	0.366
-	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	9.527 mg/m³	0.366
-	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	1.679 mg/kg bw/d	0.42
-	-	Man via environment - Combined routes	-	-	0.786

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES02 - Formulation & (re)packing of substances and mixtures Distribution of formulations

Section 1 - Title

Title	ES02 - Formulation & (re)packing of substances and mixtures Distribution of formulations
Environmental release category(ies)	- ERC2 - Formulation of preparations (mixtures)
Specific Environmental Release Category	- ESVOC SPERC 2.2v2
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 - PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - PROC15 - Use as laboratory reagent
Product category(ies)	- PC0 - Other Products

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)
Specific Environmental Release Category - ESVOC SPERC 2.2v2

Amounts used	
Value	≤ 833.3
Units	t(ons)/day
Remarks	Daily use amount at site

Value	100%
Remarks	Percentage of EU tonnage used at regional scale

Value	100%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤ 2.5E5
Units	t(ons)/year
Remarks	Annual use amount at site

Value	1.5E6
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	2.5%, 2.08E4 kg/day
Release fraction to wastewater from process (initial release prior to RMM)	0.5%, 4.17E3 kg/day
Release fraction to soil from process (initial release prior to RMM)	0.01%, -kg/day
Release fraction to wastewater from wide dispersive use	4%
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Sludge treatment	Application of the STP sludge on agricultural soil: No
Remarks	Biological STP: Site specific: Effectiveness Water: 87.38% Discharge rate of STP: ≥2E3 m^3/day

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor; Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required; The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance

Waste management	
Air	0.124%
Water	12.61%
Remarks	Sludge: 9.44E-3% Degraded: 87.25%

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors. All unrecovered waste is handled as an industrial waste that can be incinerated or in some cases re-distilled.

Section 2.2 - Control of worker exposure

Control of worker exposure	
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** **PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)** **PROC15 - Use as laboratory reagent**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	> 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed PROC1, PROC3, PROC15: 240 cm² PROC2, PROC4, PROC5, PROC9: 480 cm² PROC8a, PROC8b: 960 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC1: No specific measures identified PROC2, PROC3, PROC4, PROC5, PROC8a, PROC9, PROC15: Local exhaust ventilation - efficiency of at least 90% PROC8b: Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC1: Respiratory protection not applicable Hand protection not applicable PROC2, PROC3, PROC4, PROC5 (long-term), PROC8a, PROC8b, PROC9, PROC15: Respiratory protection not applicable Gloves: APF5 80% PROC 5 (short-term): Wear a respirator providing a minimum efficiency of 90% Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Operational conditions	Industrial

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 2.2v2

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model
Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term
Dermal 20 mg/kg bw/d
Inhalation 130 mg/m³
Man via the environment - Oral - Systemic 4 mg/kg bw/d
Man via the environment - Inhalation - Systemic 26 mg/m^3
Man via the environment - Inhalation - Local 26 mg/m^3
Derived No Effect Level (DNEL) **Short term**
Dermal 20 mg/kg bw/d
Inhalation 130 mg/m³

Calculation method EasyTRA
Exposure route Worker - all relevant routes

Exposure estimation				
Process category(ies)	**Exposure route**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PROC1	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, long-term - systemic	130 mg/m³	0.013351 mg/m³	0.000103
PROC1	Worker - combined, long-term - systemic	-	0.036193 mg/kg bw/d	0.001817
PROC1	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, short-term - systemic	130 mg/m³	0.053403 mg/m³	0.000411
PROC1	Worker - combined, short-term - systemic	-	0.041915 mg/kg bw/d	0.002125
PROC2	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, long-term - systemic	130 mg/m³	3.338 mg/m³	0.025675
PROC2	Worker - combined, long-term - systemic	-	0.7511 mg/kg bw/d	0.039389
PROC2	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC2	Worker - combined, short-term - systemic	-	2.182 mg/kg bw/d	0.116413
PROC3	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.051349
PROC3	Worker - combined, long-term - systemic	-	1.091 mg/kg bw/d	0.058206
PROC3	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative,	130 mg/m³	26.702 mg/m³	0.205397

	short-term - systemic			
PROC3	Worker - combined, short-term - systemic	-	3.952 mg/kg bw/d	0.212254
PROC4	Worker - dermal, long-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC4	Worker - inhalative, long-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC4	Worker - combined, long-term - systemic	-	3.279 mg/kg bw/d	0.17127
PROC4	Worker - dermal, short-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC4	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC4	Worker - combined, short-term - systemic	-	9 mg/kg bw/d	0.479365
PROC5	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC5	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC5	Worker - combined, long-term - systemic	-	7.511 mg/kg bw/d	0.393889
PROC5	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC5	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC5	Worker - combined, short-term - systemic	-	4.65 mg/kg bw/d	0.239841
PROC8a	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC8a	Worker - combined, long-term - systemic	-	7.511 mg/kg bw/d	0.393889
PROC8a	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC8a	Worker - combined, short-term - systemic	-	12.279 mg/kg bw/d	0.650635
PROC8b	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, long-term - systemic	130 mg/m³	10.013 mg/m³	0.077024
PROC8b	Worker - combined, long-term - systemic	-	4.173 mg/kg bw/d	0.214167
PROC8b	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, short-term - systemic	130 mg/m³	20.026 mg/m³	0.154048
PROC8b	Worker - combined, short-term - systemic	-	5.604 mg/kg bw/d	0.29119
PROC9	Worker - dermal, long-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC9	Worker - inhalative, long-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC9	Worker - combined, long-term - systemic	-	5.186 mg/kg bw/d	0.273968
PROC9	Worker - dermal, short-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571

PROC9	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC9	Worker - combined, short-term - systemic	-	9 mg/kg bw/d	0.479365
PROC15	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.51349
PROC15	Worker - combined, long-term - systemic	-	1.022 mg/kg bw/d	0.054778
PROC15	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC15	Worker - combined, short-term - systemic	-	1.976 mg/kg bw/d	0.106127

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC0 - Other Products	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	4.766 mg/m³	0.183
PC0 - Other Products	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	4.766 mg/m³	0.183
PC0 - Other Products	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	1.622 mg/kg bw/d	0.405
PC0 - Other Products	-	Man via environment - Combined routes	-	-	0.589

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**

Man via environment - Inhalation, Systemic	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation, Local	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Oral	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES03 - Use as an intermediate - Industrial

Section 1 - Title

Title	ES03 - Use as an intermediate - Industrial
Environmental release category(ies)	- ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Specific Environmental Release Category	- ESVOC SPERC 6.1a.v2
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 - PROC15 - Use as laboratory reagent
Product category(ies)	- PC0 - Other Products - Intermediate

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)

Specific Environmental Release Category - ESVOC SPERC 6.1a.v2

Amounts used	
Value	≤833.3
Units	t(ons)/day
Remarks	Daily use amount at site

Value	100%
Remarks	Percentage of EU tonnage used at regional scale

Value	100%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤2.5E5
Units	t(ons)/year
Remarks	Annual use amount at site

Value	≤2.5E5
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	2.5%, 2.08E4 kg/day
Release fraction to wastewater from process (initial release prior to RMM)	1%, 8.33E3 kg/day
Release fraction to soil from process (initial release prior to RMM)	0.1%, - kg/day
Release fraction to wastewater from wide dispersive use	5%
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Sludge treatment	Application of the STP sludge on agricultural soil: No
Remarks	Biological STP: Site specific: Effectiveness Water: 87.3% Biological wastewater treatment (WWT) may involve the use of both industrial and municipal WWT facilities. The prevalence of each type of facility was assessed in a survey of WWT technologies at 81 European chemical facilities that included both large integrated facilities and smaller dedicated stand-alone sites. The operations at these facilities included the production and formulation of a wide range of chemicals and solvents for use in a wide range of downstream applications. The survey results indicated that a majority (i.e. 89%) of the chemical facilities used a dedicated industrial wastewater treatment facility; a much smaller percentage utilized a municipal treatment plant capable of handling both industrial and domestic wastewater. Despite the limited reliance on municipal treatment facilities, their usage is conservatively assumed to exist as a normal operating condition during the production, formulation, and downstream use of solvents; Discharge rate of STP: ≥2E3 m^3/day

Technical and organisational measures	
Remarks	Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required; No obligatory Risk Management Measures (RMM); Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor

Waste management	
Air	0.124%
Water	12.61%
Remarks	Sludge: 9.44E-3% Degraded: 87.25%

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors. All unrecovered waste is handled as an industrial waste that can be incinerated or in some cases re-distilled.

Section 2.2 - Control of worker exposure	
Control of worker exposure	
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** **PROC15 - Use as laboratory reagent**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	169.2hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	> 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed: PROC1, PROC3, PROC15: 240 cm² PROC2, PROC4: 480 cm² PROC8a, PROC8b: 960 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC1: No specific measures identified. PROC2, PROC3, PROC4, PROC8a, PROC15: Local exhaust ventilation - efficiency of at least 90%. PROC8b: Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC1: Respiratory protection not applicable Hand protection not applicable PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Operational conditions	Industrial

Section 3 - Exposure estimation	
Environmental release category(ies)	- ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Specific Environmental Release Category - ESVOC SPERC 6.1a.v2

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model
Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term
- **Dermal** 20 mg/kg bw/d
- **Inhalation** 130 mg/m³
- **Man via the environment - Oral - Systemic** 4 mg/kg bw/d
- **Man via the environment - Inhalation - Systemic** 26 mg/m³
- **Man via the environment - Inhalation - Local** 26 mg/m³

Derived No Effect Level (DNEL) **Short term**
- **Dermal** 20 mg/kg bw/d
- **Inhalation** 130 mg/m³

Calculation method EasyTRA
Exposure route Worker - all relevant routes

Exposure estimation

Process category(ies)	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)
PROC1	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, long-term - systemic	130 mg/m³	0.013351 mg/m³	0.000103
PROC1	Worker - combined, long-term - systemic	-	0.036193 mg/kg bw/d	0.001817
PROC1	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, short-term - systemic	130 mg/m³	0.053403 mg/m³	0.000411
PROC1	Worker - combined, short-term - systemic	-	0.041915 mg/kg bw/d	0.002125
PROC2	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, long-term - systemic	130 mg/m³	3.338 mg/m³	0.025675
PROC2	Worker - combined, long-term - systemic	-	0.7511 mg/kg bw/d	0.039389
PROC2	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC2	Worker - combined, short-term - systemic	-	2.182 mg/kg bw/d	0.116413
PROC3	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.051349
PROC3	Worker - combined, long-term - systemic	-	1.091 mg/kg bw/d	0.058206
PROC3	Worker - dermal,	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857

	short-term - systemic			
PROC3	Worker - inhalative, short-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC3	Worker - combined, short-term - systemic	-	3.952 mg/kg bw/d	0.212254
PROC4	Worker - dermal, long-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC4	Worker - inhalative, long-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC4	Worker - combined, long-term - systemic	-	3.279 mg/kg bw/d	0.17127
PROC4	Worker - dermal, short-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC4	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC4	Worker - combined, short-term - systemic	-	9 mg/kg bw/d	0.479365
PROC8a	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC8a	Worker - combined, long-term - systemic	-	7.511 mg/kg bw/d	0.393889
PROC8a	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC8a	Worker - combined, short-term - systemic	-	12.279 mg/kg bw/d	0.650635
PROC8b	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, long-term - systemic	130 mg/m³	10.013 mg/m³	0.077024
PROC8b	Worker - combined, long-term - systemic	-	4.173 mg/kg bw/d	0.214167
PROC8b	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, short-term - systemic	130 mg/m³	20.026 mg/m³	0.154048
PROC8b	Worker - combined, short-term - systemic	-	5.604 mg/kg bw/d	0.29119
PROC15	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.051349
PROC15	Worker - combined, long-term - systemic	-	1.022 mg/kg bw/d	0.054778
PROC15	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC15	Worker - combined, short-term - systemic	-	1.976 mg/kg bw/d	0.106127

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation**

					ratio (RCR)
PC0 - Other Products Intermediate	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	4.766 mg/m³	0.183
PC0 - Other Products Intermediate	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	4.766 mg/m³	0.183
PC0 - Other Products Intermediate	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	2.594 mg/kg bw/d	0.648
PC0 - Other Products Intermediate	-	Man via environment - Combined routes	-	-	0.832

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation, Local	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Oral	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES04 - Use as a Process chemical Distribution of substance - Industrial

Section 1 - Title

Title	ES04 - Use as a Process chemical Distribution of substance - Industrial
Environmental release category(ies)	- ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category	- ESVOC SPERC 4.1.v2
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
Product category(ies)	- PC0 - Other Products - Non-reactive processing aid, solvent

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

Specific Environmental Release Category - ESVOC SPERC 4.1.v2

Amounts used	
Value	≤620
Units	t(ons)/day
Remarks	Daily use amount at site

Value	100%
Remarks	Percentage of EU tonnage used at regional scale

Value	100%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤1.86E5
Units	t(ons)/year
Remarks	Annual use amount at site

Value	1.86E5
Units	t(ons)/year

Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5%, 3.1E4 kg/day
Release fraction to wastewater from process (initial release prior to RMM)	1%, 6.2E3 kg/day
Release fraction to soil from process (initial release prior to RMM)	0.01%, - kg/day
Release fraction to wastewater from wide dispersive use	5%
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Sludge treatment	Application of the STP sludge on agricultural soil: No
Remarks	Biological STP: Site specific: Effectiveness Water: 87.38% Biological wastewater treatment (WWT) may involve the use of both industrial and municipal WWT facilities. The prevalence of each type of facility was assessed in a survey of WWT technologies at 81 European chemical facilities that included both large integrated facilities and smaller dedicated stand-alone sites. The operations at these facilities included the production and formulation of a wide range of chemicals and solvents for use in a wide range of downstream applications. The survey results indicated that a majority (i.e. 89%) of the chemical facilities used a dedicated industrial wastewater treatment facility; a much smaller percentage utilized a municipal treatment plant capable of handling both industrial and domestic wastewater. Despite the limited reliance on municipal treatment facilities, their usage is conservatively assumed to exist as a normal operating condition during the production, formulation, and downstream use of solvents Discharge rate of STP: 2E3 m^3/day

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor; Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required; The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance

Waste management	
Air	0.124%
Water	12.61%
Remarks	Sludge: 9.44E-3% Degraded: 87.25%

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane

	separators, biofilters, and/or cold oxidizers for trapping residual vapors. All unrecovered waste is handled as an industrial waste that can be incinerated or in some cases re-distilled.

Section 2.2 - Control of worker exposure

Control of worker exposure

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**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	> 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed PROC1, PROC3, PROC15: 240 cm² PROC2, PROC4, PROC9: 480 cm² PROC8a, PROC8b: 960 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC1: No specific measures identified PROC2, PROC3, PROC4, PROC8a, PROC9, PROC15: Local exhaust ventilation - efficiency of at least 90% PROC8b: Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC1: Respiratory protection not applicable Hand protection not applicable PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Operational conditions	Industrial

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 4.1.v2

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term

Dermal 20 mg/kg bw/d

Inhalation 130 mg/m³

Man via the environment - Oral - Systemic 4 mg/kg bw/d

Man via the environment - Inhalation - Systemic 26 mg/m³

Man via the environment - Inhalation - Local 26 mg/m³

Derived No Effect Level (DNEL) **Short term**

Dermal 20 mg/kg bw/d

Inhalation 130 mg/m³

Calculation method EasyTRA

Exposure route Worker - all relevant routes

Exposure estimation

Process category(ies)	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)
PROC1	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, long-term - systemic	130 mg/m³	0.013351 mg/m³	0.000103
PROC1	Worker - combined, long-term - systemic	-	0.036193 mg/kg bw/d	0.001817
PROC1	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, short-term - systemic	130 mg/m³	0.053403 mg/m³	0.000411
PROC1	Worker - combined, short-term - systemic	-	0.041915 mg/kg bw/d	0.002125
PROC2	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, long-term - systemic	130 mg/m³	3.338 mg/m³	0.025675
PROC2	Worker - combined, long-term - systemic	-	0.7511 mg/kg bw/d	0.039389
PROC2	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC2	Worker - combined, short-term - systemic	-	2.182 mg/kg bw/d	0.116413

PROC3	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.051349
PROC3	Worker - combined, long-term - systemic	-	1.091 mg/kg bw/d	0.058206
PROC3	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, short-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC3	Worker - combined, short-term - systemic	-	3.952 mg/kg bw/d	0.212254
PROC4	Worker - dermal, long-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC4	Worker - inhalative, long-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC4	Worker - combined, long-term - systemic	-	3.279 mg/kg bw/d	0.17127
PROC4	Worker - dermal, short-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC4	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC4	Worker - combined, short-term - systemic	-	9 mg/kg bw/d	0.479365
PROC8a	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC8a	Worker - combined, long-term - systemic	-	7.511 mg/kg bw/d	0.393889
PROC8a	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC8a	Worker - combined, short-term - systemic	-	12.279 mg/kg bw/d	0.650635
PROC8b	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, long-term - systemic	130 mg/m³	10.013 mg/m³	0.077024
PROC8b	Worker - combined, long-term - systemic	-	4.173 mg/kg bw/d	0.214167
PROC8b	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, short-term - systemic	130 mg/m³	20.026 mg/m³	0.154048
PROC8b	Worker - combined, short-term - systemic	-	5.604 mg/kg bw/d	0.29119
PROC9	Worker - dermal, long-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC9	Worker - inhalative, long-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC9	Worker - combined, long-term - systemic	-	5.186 mg/kg bw/d	0.273968
PROC9	Worker - dermal, short-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC9	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC9	Worker - combined,	-	9 mg/kg bw/d	0.479365

	short-term - systemic			
PROC15	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.051349
PROC15	Worker - combined, long-term - systemic	-	1.022 mg/kg bw/d	0.054778
PROC15	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC15	Worker - combined, short-term - systemic	-	1.976 mg/kg bw/d	0.106127

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC0 - Other Products Non-reactive processing aid, solvent	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	7.089 mg/m³	0.273
PC0 - Other Products Non-reactive processing aid, solvent	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	7.089 mg/m³	0.273
PC0 - Other Products Non-reactive processing aid, solvent	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	2.409 mg/kg bw/d	0.602
PC0 - Other Products Non-reactive processing aid, solvent	-	Man via environment - Combined routes	-	-	0.875

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation,	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01

Local			
Man via environment - Oral	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES06 - Use as a Fuel (use in industrial settings)

Section 1 - Title

Title	ES06 - Use as a Fuel (use in industrial settings)
Environmental release category(ies)	- ERC7 - Industrial use of substances in closed systems
Specific Environmental Release Category	- ESVOC SPERC 7.12a.v3
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 - PROC16 - Using material as fuel sources, limited exposure to unburned product to be expected - PROC19 - Manual activities involving hand contact
Product category(ies)	- PC13 - Fuels

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

Specific Environmental Release Category - ESVOC SPERC 7.12a.v3

Amounts used	
Value	≤833.3
Units	t(ons)/day
Remarks	Daily use amount at site

Value	100%
Remarks	Percentage of EU tonnage used at regional scale

Value	100%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤2.5E5
Units	t(ons)/year
Remarks	Annual use amount at site

Value	2.5E5
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	20°C
Level of dustiness	High

Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5%, 4.17E4 kg/day
Release fraction to wastewater from process (initial release prior to RMM)	1E-3%, 8.333 kg/day
Release fraction to soil from process (initial release prior to RMM)	0%, -kg/day
Release fraction to wastewater from wide dispersive use	2%
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Sludge treatment	Application of the STP sludge on agricultural soil: No
Remarks	Discharge rate of STP: ≥2E3 m^3/day Biological STP: Site specific: Effectiveness Water: 87.38% Biological wastewater treatment (WWT) may involve the use of both industrial and municipal WWT facilities. The prevalence of each type of facility was assessed in a survey of WWT technologies at 81 European chemical facilities that included both large integrated facilities and smaller dedicated stand-alone sites. The operations at these facilities included the production and formulation of a wide range of chemicals and solvents for use in a wide range of downstream applications. The survey results indicated that a majority (i.e. 89%) of the chemical facilities used a dedicated industrial wastewater treatment facility; a much smaller percentage utilized a municipal treatment plant capable of handling both industrial and domestic wastewater. Despite the limited reliance on municipal treatment facilities, their usage is conservatively assumed to exist as a normal operating condition during the production, formulation, and downstream use of solvents

Technical and organisational measures	
Remarks	Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required; The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance; No obligatory Risk Management Measures (RMM); Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor

Waste management	
Air	0.124%
Water	12.61%
Remarks	Sludge: 9.44E-3% Degraded: 87.25%

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors. All unrecovered waste is handled as an industrial waste that can be incinerated.

Section 2.2 - Control of worker exposure

Control of worker exposure

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**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	> 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed PROC1, PROC3: 240 cm² PROC2: 480 cm² PROC8a, PROC8b: 960 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC1: No specific measures identified PROC2, PROC3, PROC8a: Local exhaust ventilation - efficiency of at least 90% PROC8b: Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC1: Respiratory protection not applicable Hand protection not applicable PROC2, PROC3, PROC8a, PROC8b: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Operational conditions	Industrial

Process category(ies)	**PROC16 - Using material as fuel sources, limited exposure to unburned product to be expected** **PROC19 - Manual activities involving hand contact**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	PROC16 (long-term): 100% PROC16 (short-term): 5-25% PROC19: 10%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	PROC 16: > 4 hours / day PROC19: 1-4 hours

Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed: PROC16: 240 cm² PROC19: 1980 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC16, PROC19: No specific measures identified
Conditions and measures related to personal protection, hygiene and health evaluation	PROC16, PROC19: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Operational conditions	Industrial

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 7.12a.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term

Dermal 20 mg/kg bw/d

Inhalation 130 mg/m³

Man via the environment - Oral - Systemic 4 mg/kg bw/d

Man via the environment - Inhalation - Systemic 26 mg/m³

Man via the environment - Inhalation - Local 26 mg/m³

Derived No Effect Level (DNEL) **Short term**

Dermal 20 mg/kg bw/d

Inhalation 130 mg/m³

Calculation method EasyTRA

Exposure route Worker - all relevant routes

Exposure estimation

Process category(ies)	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)
PROC1	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, long-term - systemic	130 mg/m³	0.013351 mg/m³	0.000103
PROC1	Worker - combined, long-term - systemic	-	0.036193 mg/kg bw/d	0.001817
PROC1	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714

PROC1	Worker - inhalative, short-term - systemic	130 mg/m³	0.053403 mg/m³	0.000411
PROC1	Worker - combined, short-term - systemic	-	0.041915 mg/kg bw/d	0.002125
PROC2	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, long-term - systemic	130 mg/m³	3.338 mg/m³	0.025675
PROC2	Worker - combined, long-term - systemic	-	0.7511 mg/kg bw/d	0.039389
PROC2	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC2	Worker - combined, short-term - systemic	-	2.182 mg/kg bw/d	0.116413
PROC3	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.051349
PROC3	Worker - combined, long-term - systemic	-	1.091 mg/kg bw/d	0.058206
PROC3	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, short-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC3	Worker - combined, short-term - systemic	-	3.952 mg/kg bw/d	0.212254
PROC8a	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC8a	Worker - combined, long-term - systemic	-	7.511 mg/kg bw/d	0.393889
PROC8a	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC8a	Worker - combined, short-term - systemic	-	12.279 mg/kg bw/d	0.650635
PROC8b	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, long-term - systemic	130 mg/m³	10.013 mg/m³	0.077024
PROC8b	Worker - combined, long-term - systemic	-	4.173 mg/kg bw/d	0.214167
PROC8b	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, short-term - systemic	130 mg/m³	20.026 mg/m³	0.154048
PROC8b	Worker - combined, short-term - systemic	-	5.604 mg/kg bw/d	0.29119
PROC16	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.68571 mg/kg bw/d	0.003429
PROC16	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC16	Worker - combined, long-term - systemic	-	4.837 mg/kg bw/d	0.260175
PROC16	Worker - dermal,	20 mg/kg bw/d	0.041143 mg/kg bw/d	0.002057

	short-term - systemic			
PROC16	Worker - inhalative, short-term - systemic	130 mg/m³	80.105 mg/m³	0.61619
PROC16	Worker - combined, short-term - systemic	-	11.485 mg/kg bw/d	0.618248
PROC19	Worker - dermal, long-term - systemic	20 mg/kg bw/d	1.697 mg/kg bw/d	0.084857
PROC19	Worker - inhalative, long-term - systemic	130 mg/m³	20.026 mg/m³	0.154048
PROC19	Worker - combined, long-term - systemic	-	4.558 mg/kg bw/d	0.238905
PROC19	Worker - dermal, short-term - systemic	20 mg/kg bw/d	1.697 mg/kg bw/d	0.084857
PROC19	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC19	Worker - combined, short-term - systemic	-	11.233 mg/kg bw/d	0.598349

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC13 - Fuels	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	9.526 mg/m³	0.366
PC13 - Fuels	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	9.526 mg/m³	0.366
PC13 - Fuels	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	1.464 mg/kg bw/d	0.366
PC13 - Fuels	-	Man via environment - Combined routes	-	-	0.732

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level**	**PEC local due to**	**Risk characterisation ratio**

	(DNEL)	widespread uses	(RCR)
Man via environment - Inhalation, Systemic	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation, Local	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Oral	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES05 - Use in Cleaning Agents (use in industrial settings)

Section 1 - Title

Title	ES05 - Use in Cleaning Agents (use in industrial settings)
Environmental release category(ies)	- ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category	- ESVOC SPERC 4.4a.v3
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 - 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 - PROC10 - Roller application or brushing - PROC13 - Treatment of articles by dipping and pouring
Product category(ies)	- PC0 - Other Products - Solvent

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

Specific Environmental Release Category - ESVOC SPERC 4.4a.v3

Amounts used	
Value	≤780
Units	t(ons)/day
Remarks	Daily use amount at site

Value	100%
Remarks	Percentage of EU tonnage used at regional scale

Value	100%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤1.56E4
Units	t(ons)/year
Remarks	Annual use amount at site

Value	1.56E4
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	98%, 7.64E5 kg/day
Release fraction to wastewater from process (initial release prior to RMM)	0.01%, 78 kg/day
Release fraction to soil from process (initial release prior to RMM)	0%, -kg/day
Release fraction to wastewater from wide dispersive use	4%
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Sludge treatment	Application of the STP sludge on agricultural soil: No
Remarks	Discharge rate of STP: ≥2E3 m^3/day Biological STP: Site specific: Effectiveness Water: 87.38% Biological wastewater treatment (WWT) may involve the use of both industrial and municipal WWT facilities. The prevalence of each type of facility was assessed in a survey of WWT technologies at 81 European chemical facilities that included both large integrated facilities and smaller dedicated stand-alone sites. The operations at these facilities included the production and formulation of a wide range of chemicals and solvents for use in a wide range of downstream applications. The survey results indicated that a majority (i.e. 89%) of the chemical facilities used a dedicated industrial wastewater treatment facility; a much smaller percentage utilized a municipal treatment plant capable of handling both industrial and domestic wastewater. Despite the limited reliance on municipal treatment facilities, their usage is conservatively assumed to exist as a normal operating condition during the production, formulation, and downstream use of solvents

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and/or the established practices; Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required; The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance

Waste management	
Air	0.124%
Water	12.61%
Remarks	Sludge: 9.44E-3% Degraded 87.25%

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors Solvent-containing liquid cleaning wastes are handled as hazardous waste and disposed of via thermal or

	catalytic incineration capable of efficiently converting volatile organic compounds to carbon dioxide and water. Hazardous waste handling conforms with the requirements of the Waste Framework Directive and includes procedures that minimize release during production, collection, storage, transportation, and treatment. These measures include a ban on the mixing of waste types, suitable packaging and labelling, and detailed documentation on the sources, quantities, and characteristics of the waste

Section 2.2 - Control of worker exposure

Control of worker exposure

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** **PROC10 - Roller application or brushing** **PROC13 - Treatment of articles by dipping and pouring**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b: 100% PROC10: 80%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	> 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed PROC1, PROC3: 240 cm² PROC2, PROC4, PROC13: 480 cm² PROC8a, PROC8b, PROC10: 960 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC1: No specific measures identified PROC2, PROC3, PROC4, PROC8a, PROC10, PROC13: Local exhaust ventilation - efficiency of at least 90% PROC8b: Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC1: Respiratory protection not applicable Hand protection not applicable PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC13: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Operational conditions	Industrial

Process category(ies)	**PROC7 - Industrial spraying**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	25%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	> 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed: 1500 cm²
Technical conditions and measures to control dispersion from source towards the worker	General ventilation, Mechanical ventilation giving at least 30%
Conditions and measures related to personal protection, hygiene and health evaluation	Half-face mask (DIN EN 140): with filter for vapours/gases Wear a respirator providing a minimum efficiency of 90% Gloves: APF5 80%
Indoor/Outdoor use	Indoor
Use in room with a volume of minimum	> 1000 m3
Minimum room ventilation rate for handling/application (air changes per hour)	30%
Operational conditions	Industrial

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 4.4a.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term

Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³
Man via the environment - Oral - Systemic	4 mg/kg bw/d
Man via the environment - Inhalation - Systemic	26 mg/m³
Man via the environment - Inhalation - Local	26 mg/m³

Derived No Effect Level (DNEL) **Short term**

Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³

Calculation method EasyTRA
Exposure route Worker - all relevant routes

Exposure estimation				
Process category(ies)	**Exposure route**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PROC1	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, long-term - systemic	130 mg/m³	0.013351 mg/m³	0.000103
PROC1	Worker - combined, long-term - systemic	-	0.036193 mg/kg bw/d	0.001817
PROC1	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, short-term - systemic	130 mg/m³	0.053403 mg/m³	0.000411
PROC1	Worker - combined, short-term - systemic	-	0.041915 mg/kg bw/d	0.002125
PROC2	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, long-term - systemic	130 mg/m³	3.338 mg/m³	0.025675
PROC2	Worker - combined, long-term - systemic	-	0.7511 mg/kg bw/d	0.039389
PROC2	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC2	Worker - combined, short-term - systemic	-	2.182 mg/kg bw/d	0.116413
PROC3	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.051349
PROC3	Worker - combined, long-term - systemic	-	1.091 mg/kg bw/d	0.058206
PROC3	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, short-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC3	Worker - combined, short-term - systemic	-	3.952 mg/kg bw/d	0.212254
PROC4	Worker - dermal, long-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC4	Worker - inhalative, long-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC4	Worker - combined, long-term - systemic	-	3.279 mg/kg bw/d	0.17127
PROC4	Worker - dermal, short-term - systemic	20 mg/kg bw/d	1.371 mg/kg bw/d	0.068571
PROC4	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC4	Worker - combined, short-term - systemic	-	9 mg/kg bw/d	0.479365
PROC7	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.143 mg/kg bw/d	0.107143
PROC7	Worker - inhalative, long-term - systemic	130 mg/m³	19.14 mg/m³	0.147231
PROC7	Worker - combined, long-term - systemic	-	4.877 mg/kg bw/d	0.254374

PROC7	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.143 mg/kg bw/d	0.107143
PROC7	Worker - inhalative, short-term - systemic	130 mg/m³	19.14 mg/m³	0.147231
PROC7	Worker - combined, short-term - systemic	-	4.877 mg/kg bw/d	0.254374
PROC8a	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC8a	Worker - combined, long-term - systemic	-	7.511 mg/kg bw/d	0.393889
PROC8a	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8a	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC8a	Worker - combined, short-term - systemic	-	12.279 mg/kg bw/d	0.650635
PROC8b	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, long-term - systemic	130 mg/m³	10.013 mg/m³	0.077024
PROC8b	Worker - combined, long-term - systemic	-	4.173 mg/kg bw/d	0.214167
PROC8b	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC8b	Worker - inhalative, short-term - systemic	130 mg/m³	20.026 mg/m³	0.154048
PROC8b	Worker - combined, short-term - systemic	-	5.604 mg/kg bw/d	0.29119
PROC10	Worker - dermal, long-term - systemic	20 mg/kg bw/d	4.389 mg/kg bw/d	0.219429
PROC10	Worker - inhalative, long-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC10	Worker - combined, long-term - systemic	-	8.203 mg/kg bw/d	0.424825
PROC10	Worker - dermal, short-term - systemic	20 mg/kg bw/d	4.389 mg/kg bw/d	0.219429
PROC10	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC10	Worker - combined, short-term - systemic	-	12.018 mg/kg bw/d	0.630222
PROC13	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC13	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC13	Worker - combined, long-term - systemic	-	7.511 mg/kg bw/d	0.393889
PROC13	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC13	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC13	Worker - combined, short-term - systemic	-	12.279 mg/kg bw/d	0.650635

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect**	**Exposure**	**Risk**

			Level (DNEL)	estimation	characterisation ratio (RCR)
PC0 - Other Products Solvent	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	11.65 mg/m³	0.448
PC0 - Other Products Solvent	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	11.65 mg/m³	0.448
PC0 - Other Products Solvent	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	1.789 mg/kg bw/d	0.447
PC0 - Other Products Solvent	-	Man via environment - Combined routes	-	-	0.895

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation, Local	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Oral	4 mg/kg bw/d	-	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES07 - Use as laboratory reagent/agent (use in industrial settings)

Section 1 - Title

Title	ES07 - Use as laboratory reagent/agent (use in industrial settings)
Environmental release category(ies)	- ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category	- ESVOC SPERC 4.1.v2
Process category(ies)	- PROC10 - Roller application or brushing - PROC15 - Use as laboratory reagent
Product category(ies)	- PC21 - Laboratory chemicals

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

Specific Environmental Release Category - ESVOC SPERC 4.1.v2

Amounts used	
Value	≤620
Units	t(ons)/day
Remarks	Daily use amount at site

Value	100%
Remarks	Percentage of EU tonnage used at regional scale

Value	100%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤1.86E5
Units	t(ons)/year
Remarks	Annual use amount at site

Value	1.86E5
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process	5%, 3.1E4 kg/day

(initial release prior to RMM)	
Release fraction to wastewater from process (initial release prior to RMM)	1%, 6.2E3 kg/day
Release fraction to soil from process (initial release prior to RMM)	0.01%, - kg/day
Release fraction to wastewater from wide dispersive use	5%
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Sludge treatment	Application of the STP sludge on agricultural soil: No
Remarks	Biological STP: Site specific: Effectiveness Water: 87.38% Biological wastewater treatment (WWT) may involve the use of both industrial and municipal WWT facilities. The prevalence of each type of facility was assessed in a survey of WWT technologies at 81 European chemical facilities that included both large integrated facilities and smaller dedicated stand-alone sites. The operations at these facilities included the production and formulation of a wide range of chemicals and solvents for use in a wide range of downstream applications. The survey results indicated that a majority (i.e. 89%) of the chemical facilities used a dedicated industrial wastewater treatment facility; a much smaller percentage utilized a municipal treatment plant capable of handling both industrial and domestic wastewater. Despite the limited reliance on municipal treatment facilities, their usage is conservatively assumed to exist as a normal operating condition during the production, formulation, and downstream use of solvents Discharge rate of STP: ≥2E3 m^3/day

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor; Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required; The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance

Waste management	
Air	0.124%
Water	12.61%
Remarks	Sludge: 9.44E-3% Degraded: 87.25%

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors. All unrecovered waste is handled as an industrial waste that can be incinerated or in some cases re-distilled.

Section 2.2 - Control of worker exposure

Control of worker exposure	
Process category(ies)	**PROC10 - Roller application or brushing** **PROC15 - Use as laboratory reagent**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	PROC10: 80%

	PROC15: 100%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	> 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed: PROC10: 960 cm² PROC15: 240 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC10, PROC15: Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC10, PROC15: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Operational conditions	Industrial

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 4.1.v2

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term

Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³
Man via the environment - Oral - Systemic	4 mg/kg bw/d
Man via the environment - Inhalation - Systemic	26 mg/m³
Man via the environment - Inhalation - Local	26 mg/m³

Derived No Effect Level (DNEL) **Short term**

Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³

Calculation method EasyTRA

Exposure route Worker - all relevant routes

Exposure estimation

Process category(ies)	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)

PROC10	Worker - dermal, long-term - systemic	20 mg/kg bw/d	4.389 mg/kg bw/d	0.219429
PROC1	Worker - inhalative, long-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC1	Worker - combined, long-term - systemic	-	8.203 mg/kg bw/d	0.424825
PROC1	Worker - dermal, short-term - systemic	20 mg/kg bw/d	4.389 mg/kg bw/d	0.219429
PROC1	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC1	Worker - combined, short-term - systemic	-	12.018 mg/kg bw/d	0.630222
PROC15	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, long-term - systemic	130 mg/m³	6.675 mg/m³	0.051349
PROC15	Worker - combined, long-term - systemic	-	1.022 mg/kg bw/d	0.054778
PROC15	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC15	Worker - combined, short-term - systemic	-	1.976 mg/kg bw/d	0.106127

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC21 - Laboratory chemicals	-	Man via environment - Inhalation, Systemic; Local	26 mg/m³	7.089 mg/m³	0.273
PC21 - Laboratory chemicals	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	26 mg/m³	0.273
PC21 - Laboratory chemicals	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	2.409 mg/kg bw/d	0.602
PC21 - Laboratory chemicals	-	Man via environment - Combined routes	-	-	0.875

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01

via food consumption			
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation, Local	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Oral	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES08 - Use as wastewater treatment chemical (use in industrial settings)

Section 1 - Title

Title	ES08 - Use as wastewater treatment chemical (use in industrial settings)
Environmental release category(ies)	- ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category	- ESVOC SPERC 3.22a.v3
Process category(ies)	- PROC2 - Use in closed, continuous process with occasional controlled exposure
Product category(ies)	- PC37 - Water treatment chemicals

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

Specific Environmental Release Category - ESVOC SPERC 3.22a.v3

Amounts used	
Value	≤18
Units	t(ons)/day
Remarks	Daily use amount at site

Value	100%
Remarks	Percentage of EU tonnage used at regional scale

Value	100%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤5.4E3
Units	t(ons)/year
Remarks	Annual use amount at site

Value	5.4E3
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.03%, 5.4 kg/day

Release fraction to wastewater from process (initial release prior to RMM)	82%, 1.48E4 kg/day
Release fraction to soil from process (initial release prior to RMM)	0%, -kg/day
Release fraction to wastewater from wide dispersive use	0.1%
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Sludge treatment	Application of the STP sludge on agricultural soil: No
Remarks	Discharge rate of STP: ≥2E3 m^3/day Biological STP: Site specific: Effectiveness Water: 87.38% Biological wastewater treatment (WWT) may involve the use of both industrial and municipal WWT facilities. The prevalence of each type of facility was assessed in a survey of WWT technologies at 81 European chemical facilities that included both large integrated facilities and smaller dedicated stand-alone sites. The operations at these facilities included the production and formulation of a wide range of chemicals and solvents for use in a wide range of downstream applications. The survey results indicated that a majority (i.e. 89%) of the chemical facilities used a dedicated industrial wastewater treatment facility; a much smaller percentage utilized a municipal treatment plant capable of handling both industrial and domestic wastewater. Despite the limited reliance on municipal treatment facilities, their usage is conservatively assumed to exist as a normal operating condition during the production, formulation, and downstream use of solvents

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor; Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required; The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance

Waste management	
Air	0.124%
Water	12.61%
Remarks	Sludge 9.44E-3% Degraded: 87.25%

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors. All unrecovered waste is handled as an industrial waste that can be incinerated.

Section 2.2 - Control of worker exposure

Control of worker exposure	
Process category(ies)	**PROC2 - Use in closed, continuous process with occasional controlled exposure**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	169.2 hPa

Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	> 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed: PROC2: 480 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC2: Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC2: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Operational conditions	Industrial

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 3.22a.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term

Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³
Man via the environment - Oral - Systemic	4 mg/kg bw/d
Man via the environment - Inhalation - Systemic	26 mg/m³
Man via the environment - Inhalation - Local	26 mg/m³

Derived No Effect Level (DNEL) **Short term**

Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³

Calculation method EasyTRA

Exposure route Worker - all relevant routes

Exposure estimation

Process category(ies)	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)
PROC2	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, long-term - systemic	130 mg/m³	3.338 mg/m³	0.025675

PROC2	Worker - combined, long-term - systemic	-	0.7511 mg/kg bw/d	0.039389
PROC2	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC2	Worker - combined, short-term - systemic	-	2.182 mg/kg bw/d	0.116413

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC37 - Water treatment chemicals	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	9.76E-3 mg/m³	<0.01
PC37 - Water treatment chemicals	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	9.76E-3 mg/m³	<0.01
PC37 - Water treatment chemicals	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	3.454 mg/kg bw/d	0.863
PC37 - Water treatment chemicals	-	Man via environment - Combined routes	-	-	0.864

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation, Local	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Oral	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES09 - Use in Oilfield drilling and production operations (use in industrial settings)

Section 1 - Title

Title	ES09 - Use in Oilfield drilling and production operations (use in industrial settings)
Environmental release category(ies)	- ERC7 - Industrial use of substances in closed systems
Specific Environmental Release Category	- ESVOC SPERC 7.12a.v3
Process category(ies)	- 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
Product category(ies)	- PC41 - Oil and gas exploration or production products

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
Specific Environmental Release Category - ESVOC SPERC 7.12a.v3

Amounts used	
Value	≤833.3
Units	t(ons)/day
Remarks	Daily use amount at site

Value	100%
Remarks	Percentage of EU tonnage used at regional scale

Value	100%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤2.5E5
Units	t(ons)/year
Remarks	Annual use amount at site

Value	2.5E5
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High

Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5%, 4.17E4 kg/day
Release fraction to wastewater from process (initial release prior to RMM)	1E-3%, 8.333 kg/day
Release fraction to soil from process (initial release prior to RMM)	0%, - kg/day
Release fraction to wastewater from wide dispersive use	2%
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Sludge treatment	Application of the STP sludge on agricultural soil: No
Remarks	Discharge rate of STP: ≥2E3 m^3/day Biological STP: Site specific: Effectiveness Water: 87.38% Biological wastewater treatment (WWT) may involve the use of both industrial and municipal WWT facilities. The prevalence of each type of facility was assessed in a survey of WWT technologies at 81 European chemical facilities that included both large integrated facilities and smaller dedicated stand-alone sites. The operations at these facilities included the production and formulation of a wide range of chemicals and solvents for use in a wide range of downstream applications. The survey results indicated that a majority (i.e. 89%) of the chemical facilities used a dedicated industrial wastewater treatment facility; a much smaller percentage utilized a municipal treatment plant capable of handling both industrial and domestic wastewater. Despite the limited reliance on municipal treatment facilities, their usage is conservatively assumed to exist as a normal operating condition during the production, formulation, and downstream use of solvents

Technical and organisational measures	
Remarks	Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required; The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance; No obligatory Risk Management Measures (RMM); Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor

Waste management	
Air	0.124%
Water	12.61%
Remarks	Sludge: 9.44E-3% Degraded: 87.25%

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors. All unrecovered waste is handled as an industrial waste that can be incinerated.

Section 2.2 - Control of worker exposure

Control of worker exposure

Process category(ies)	**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**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	PROC4: 100% PROC5, PROC8a, PROC8b: 5%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	PROC4: 1-4 hours / day PROC5, PROC8a, PROC8b: > 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed: PROC4, PROC5: 480 cm² PROC8a, PROC8b: 960 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC4: Local exhaust ventilation - efficiency of at least 90% PROC5, PROC8a, PROC8b: No specific measures identified
Conditions and measures related to personal protection, hygiene and health evaluation	PROC4, PROC5, PROC8a, PROC8b: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Operational conditions	Industrial

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 7.12a.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term

Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³
Man via the environment - Oral - Systemic	4 mg/kg bw/d
Man via the environment - Inhalation - Systemic	26 mg/m³
Man via the environment - Inhalation - Local	26 mg/m³
Derived No Effect Level (DNEL)	**Short term**
Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³

Calculation method EasyTRA
Exposure route Worker - all relevant routes

Exposure estimation

Process category(ies)	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)
PROC4	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.822857 mg/kg bw/d	0.041143
PROC4	Worker - inhalative, long-term - systemic	130 mg/m³	8.01 mg/m³	0.061619
PROC4	Worker - combined, long-term - systemic	-	1.967 mg/kg bw/d	0.102762
PROC4	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.822857 mg/kg bw/d	0.041143
PROC4	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC4	Worker - combined, short-term - systemic	-	8.452 mg/kg bw/d	0.451936
PROC5	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC5	Worker - inhalative, long-term - systemic	130 mg/m³	16.688 mg/m³	0.128373
PROC5	Worker - combined, long-term - systemic	-	2.521 mg/kg bw/d	0.13523
PROC5	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC5	Worker - inhalative, short-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC5	Worker - combined, short-term - systemic	-	4.905 mg/kg bw/d	0.263603
PROC8a	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8a	Worker - inhalative, long-term - systemic	130 mg/m³	16.688 mg/m³	0.128373
PROC8a	Worker - combined, long-term - systemic	-	2.521 mg/kg bw/d	0.13523
PROC8a	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8a	Worker - inhalative, short-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC8a	Worker - combined, short-term - systemic	-	4.905 mg/kg bw/d	0.263603
PROC8b	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8b	Worker - inhalative, long-term - systemic	130 mg/m³	10.013 mg/m³	0.077024
PROC8b	Worker - combined, long-term - systemic	-	1.568 mg/kg bw/d	0.083881

PROC8b	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8b	Worker - inhalative, short-term - systemic	130 mg/m³	20.026 mg/m³	0.154048
PROC8b	Worker - combined, short-term - systemic	-	2.998 mg/kg bw/d	0.160905

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC41 - Oil and gas exploration or production products	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	9.526 mg/m³	0.366
PC41 - Oil and gas exploration or production products	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	9.526 mg/m³	0.366
PC41 - Oil and gas exploration or production products	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	1.464 mg/kg bw/d	0.366
PC41 - Oil and gas exploration or production products	-	Man via environment - Combined routes	-	-	0.732

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	4 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation, Local	26 mg/m³	5.63E-3 mg/m³	<0.01
Man via environment - Oral	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES10 - Widespread use by professional workers - Use as a Fuel (use in professional settings)

Section 1 - Title

Title	ES10 - Widespread use by professional workers - Use as a Fuel (use in professional settings)
Environmental release category(ies)	- ERC9b - Wide dispersive outdoor use of substances in closed systems - ERC9a - Wide dispersive indoor use of substances in closed systems
Specific Environmental Release Category	- ESVOC SPERC 9.12b.v3
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 - PROC16 - Using material as fuel sources, limited exposure to unburned product to be expected - PROC19 - Manual activities involving hand contact
Product category(ies)	- PC13 - Fuels

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

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

Specific Environmental Release Category - ESVOC SPERC 9.12b.v3

Amounts used	
Value	10%
Remarks	Percentage of EU tonnage used at regional scale

Value	0.05%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤0.034
Units	t(ons)/day
Remarks	Daily local widespread use amount

Value	2.5E5
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High

Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.5%, - kg/day
Release fraction to wastewater from process (initial release prior to RMM)	1E-4%, 3.43E-5 kg/day
Release fraction to soil from process (initial release prior to RMM)	0.025%, - kg/day
Release fraction to wastewater from wide dispersive use	2%
Remarks	Indoor use. Outdoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Remarks	Biological STP: Standard: Effectiveness Water: 87.38%

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and/or the established practices; RMM limiting release to water: The release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m3/day; Emissions to soil are minimized when the product is used in accordance with the manufacturers' instructions and / or the established practices

Conditions and measures related to external treatment of waste for disposal	
Waste treatment methods	Unused and spent products and solutions should be appropriately labelled and stored for eventual recovery or disposal as hazardous waste. A suitable unbreakable and closable container should be used when storing and shipping hazardous materials. The containers must be solvent compatible, leakproof, and free of any defects. Contaminated debris such as disposable paper towels, brushes, rollers, masks, transfer vessels, and wipes that may contain small amounts of solvent residue need to be handled as hazardous waste and properly disposed of in a manner that is consistent with local, regional, and national regulations. Direct disposal of waste into a municipal sewer system needs to conform with all applicable laws and regulations. A spill plan needs to be available that outlines the steps to be taken to minimize any potential health and environmental threats

Section 2.2 - Control of worker exposure

Control of worker exposure	
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** **PROC16 - Using material as fuel sources, limited exposure to unburned product to be expected**

	PROC19 - Manual activities involving hand contact
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	PROC1, PROC2, PROC3, PROC16 (long-term): 100% PROC8a, PROC8b: 5% PROC 16 (short-term): 5-25% PROC 19: 10%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16: > 4 hours / day PROC19: 1-4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed: PROC1, PROC3, PROC16: 240 cm² PROC2: 480 cm² PROC8a, PROC8b: 960 cm² PROC19: 1980 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC1, PROC8a, PROC8b, PROC16, PROC19: No specific measures identified PROC2, PROC3: Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC1: Respiratory protection not applicable Hand protection not applicable PROC2, PROC3, PROC8a, PROC8b, PROC16, PROC19: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor use. Outdoor use.
Minimum room ventilation rate for handling/application (air changes per hour)	30%
Remarks	Room ventilation required for PROC16 (short-term)
Operational conditions	Professional

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 9.12b.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term

Dermal 20 mg/kg bw/d

Inhalation 130 mg/m³

Man via the environment - Oral - Systemic 4 mg/kg bw/d
Man via the environment - Inhalation - Systemic 26 mg/m³
Man via the environment - Inhalation - Local 26 mg/m³
Derived No Effect Level (DNEL) **Short term**
Dermal 20 mg/kg bw/d
Inhalation 130 mg/m³

Calculation method EasyTRA
Exposure route Worker - all relevant routes

Exposure estimation				
Process category(ies)	**Exposure route**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PROC1	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, long-term - systemic	130 mg/m³	0.133508 mg/m³	0.001027
PROC1	Worker - combined, long-term - systemic	-	0.053358 mg/kg bw/d	0.002741
PROC1	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, short-term - systemic	130 mg/m³	0.534032 mg/m³	0.004108
PROC1	Worker - combined, short-term - systemic	-	0.110576 mg/kg bw/d	0.005822
PROC2	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, long-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC2	Worker - combined, long-term - systemic	-	2.182 mg/kg bw/d	0.116413
PROC2	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC2	Worker - combined, short-term - systemic	-	7.903 mg/kg bw/d	0.424508
PROC3	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, long-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC3	Worker - combined, long-term - systemic	-	3.952 mg/kg bw/d	0.212254
PROC3	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, short-term - systemic	130 mg/m³	106.806 mg/m³	0.821587
PROC3	Worker - combined, short-term - systemic	-	15.395 mg/kg bw/d	0.828444
PROC8a	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8a	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC8a	Worker - combined, long-term - systemic	-	4.905 mg/kg bw/d	0.263603
PROC8a	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857

PROC8a	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC8a	Worker - combined, short-term - systemic	-	9.673 mg/kg bw/d	0.520349
PROC8b	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8b	Worker - inhalative, long-term - systemic	130 mg/m³	16.688 mg/m³	0.128373
PROC8b	Worker - combined, long-term - systemic	-	2.521 mg/kg bw/d	0.13523
PROC8b	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8b	Worker - inhalative, short-term - systemic	130 mg/m³	33.377 mg/m³	0.253746
PROC8b	Worker - combined, short-term - systemic	-	4.905 mg/kg bw/d	0.263603
PROC16	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, long-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC16	Worker - combined, long-term - systemic	-	9.605 mg/kg bw/d	0.516921
PROC16	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.041143 mg/kg bw/d	0.002057
PROC16	Worker - inhalative, short-term - systemic	130 mg/m³	112.147 mg/m³	0.862667
PROC16	Worker - combined, short-term - systemic	-	16.062 mg/kg bw/d	0.864724
PROC19	Worker - dermal, long-term - systemic	20 mg/kg bw/d	1.697 mg/kg bw/d	0.084857
PROC19	Worker - inhalative, long-term - systemic	130 mg/m³	40.052 mg/m³	0.308095
PROC19	Worker - combined, long-term - systemic	-	7.419 mg/kg bw/d	0.392952
PROC19	Worker - dermal, short-term - systemic	20 mg/kg bw/d	1.697 mg/kg bw/d	0.084857
PROC19	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC19	Worker - combined, short-term - systemic	-	3.604 mg/kg bw/d	0.187556

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation

Product category(ies)	Sector(s) of use	Protection target	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)
PC13 - Fuels	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
PC13 - Fuels	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
PC13 - Fuels	-	Man via environment - Oral; Exposure via food	4 mg/kg bw/d	9.46E-3 mg/m³	<0.01

		consumption			
PC13 - Fuels	-	Man via environment - Combined routes	-	-	<0.01
Total releases to the environment per year from all life cycle stages					
Water	4.11E8 kg/year				
Air	2.05E8 kg/year				
Soil	8.8E7 kg/year				

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES11 - Widespread use by professional workers - Use in Cleaning Agents (use in professional settings)

Section 1 - Title

Title	ES11 - Widespread use by professional workers - Use in Cleaning Agents (use in professional settings)
Environmental release category(ies)	- ERC8d - Wide dispersive outdoor use of processing aids in open systems - ERC8a - Wide dispersive indoor use of processing aids in open systems
Specific Environmental Release Category	- ESVOC SPERC 8.4b.v3
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 - PROC10 - Roller application or brushing - PROC11 - Non industrial spraying - PROC13 - Treatment of articles by dipping and pouring
Product category(ies)	- PC0 - Other Products - Solvent

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
- ERC8a - Wide dispersive indoor use of processing aids in open systems
Specific Environmental Release Category - ESVOC SPERC 8.4b.v3

Amounts used	
Value	10%
Remarks	Percentage of EU tonnage used at regional scale

Value	0.05%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤0.034
Units	t(ons)/day
Remarks	Daily local widespread use amount

Value	2.5E5
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid

Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	4%, - kg/day
Release fraction to wastewater from process (initial release prior to RMM)	1E-4%, 3.43E-5kg/day
Release fraction to soil from process (initial release prior to RMM)	2E-5%, - kg/day
Release fraction to wastewater from wide dispersive use	4%
Remarks	Indoor use. Outdoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Remarks	Biological STP: Standard: Effectiveness Water: 87.38%

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and/or the established practices; RMM limiting release to water: The release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m3/day; Emissions to soil are minimized when the product is used in accordance with the manufacturers' instructions and / or the established practices

Conditions and measures related to external treatment of waste for disposal	
Waste treatment methods	Unused and spent products and solutions should be appropriately labelled and stored for eventual recovery or disposal as hazardous waste. A suitable unbreakable and closable container should be used when storing and shipping hazardous materials. The containers must be solvent compatible, leakproof, and free of any defects. Contaminated debris such as disposable paper towels, brushes, rollers, masks, transfer vessels, and wipes that may contain small amounts of solvent residue need to be handled as hazardous waste and properly disposed of in a manner that is consistent with local, regional, and national regulations. Direct disposal of waste into a municipal sewer system needs to conform with all applicable laws and regulations. A spill plan needs to be available that outlines the steps to be taken to minimize any potential health and environmental threats

Section 2.2 - Control of worker exposure

Control of worker exposure	
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
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	PROC1, PROC2, PROC3, PROC4: 100% PROC8a: 5% PROC8b: 10%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	PROC1, PROC2, PROC3, PROC8A, PROC8B: > 4 hours / day PROC4: 1-4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed: PROC1, PROC3: 240 cm² PROC2, PROC4: 480 cm² PROC8a, PROC8b: 960 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC1, PROC8a, PROC8b: No specific measures identified PROC2, PROC3, PROC4: Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC1: Respiratory protection not applicable Hand protection not applicable PROC2, PROC3, PROC4, PROC8a, PROC8b: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor use. Outdoor use.
Minimum room ventilation rate for handling/application (air changes per hour)	30%
Remarks	Room ventilation required for PROC4 (short-term)
Operational conditions	Professional

Process category(ies)	**PROC10 - Roller application or brushing** **PROC11 - Non industrial spraying** **PROC13 - Treatment of articles by dipping and pouring**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	PROC10: 5% PROC11: 3% PROC13: 100%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	>4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed: PROC10: 960 cm² PROC11: 1500 cm² PROC13: 480 cm²

Technical conditions and measures to control dispersion from source towards the worker	PROC10, PROC11: No specific measures identified PROC13: Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC10, PROC13 (long-term): Respiratory protection not applicable Gloves: APF5 80% PROC11: Wear a half-mask respirator, selected in accordance with EN 529 Efficiency of at least 90% Gloves: APF5 90% PROC 13 (short-term): Wear a respirator providing a minimum efficiency of 90% Wear suitable gloves tested to EN 374, 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None
Indoor/Outdoor use	Indoor
Use in room with a volume of minimum	PROC11: 100-1000m3
Operational conditions	Professional

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 8.4b.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model
Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term
- **Dermal** 20 mg/kg bw/d
- **Inhalation** 130 mg/m³
- **Man via the environment - Oral - Systemic** 4 mg/kg bw/d
- **Man via the environment - Inhalation - Systemic** 26 mg/m³
- **Man via the environment - Inhalation - Local** 26 mg/m³

Derived No Effect Level (DNEL) **Short term**
- **Dermal** 20 mg/kg bw/d
- **Inhalation** 130 mg/m³

Calculation method EasyTRA
Exposure route Worker - all relevant routes

Exposure estimation

Process category(ies)	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)
PROC1	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, long-term - systemic	130 mg/m³	0.133508 mg/m³	0.001027
PROC1	Worker - combined, long-term - systemic	-	0.053358 mg/kg bw/d	0.002741

PROC1	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.034286 mg/kg bw/d	0.001714
PROC1	Worker - inhalative, short-term - systemic	130 mg/m³	0.534032 mg/m³	0.004108
PROC1	Worker - combined, short-term - systemic	-	0.110576 mg/kg bw/d	0.005822
PROC2	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, long-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC2	Worker - combined, long-term - systemic	-	2.182 mg/kg bw/d	0.116413
PROC2	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC2	Worker - inhalative, short-term - systemic	130 mg/m³	53.403 mg/m³	0.410794
PROC2	Worker - combined, short-term - systemic	-	7.903 mg/kg bw/d	0.424508
PROC3	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, long-term - systemic	130 mg/m³	26.702 mg/m³	0.205397
PROC3	Worker - combined, long-term - systemic	-	3.952 mg/kg bw/d	0.212254
PROC3	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC3	Worker - inhalative, short-term - systemic	130 mg/m³	106.806 mg/m³	0.821587
PROC3	Worker - combined, short-term - systemic	-	15.395 mg/kg bw/d	0.828444
PROC4	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.822857 mg/kg bw/d	0.041143
PROC4	Worker - inhalative, long-term - systemic	130 mg/m³	40.052 mg/m³	0.308095
PROC4	Worker - combined, long-term - systemic	-	6.545 mg/kg bw/d	0.349238
PROC4	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.822857 mg/kg bw/d	0.041143
PROC4	Worker - inhalative, short-term - systemic	130 mg/m³	18.691 mg/m³	0.143778
PROC4	Worker - combined, short-term - systemic	-	3.493 mg/kg bw/d	0.184921
PROC8a	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8a	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC8a	Worker - combined, long-term - systemic	-	4.905 mg/kg bw/d	0.263603
PROC8a	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8a	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC8a	Worker - combined, short-term - systemic	-	9.673 mg/kg bw/d	0.520349
PROC8b	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8b	Worker - inhalative, long-term - systemic	130 mg/m³	16.688 mg/m³	0.128373
PROC8b	Worker - combined,	-	2.521 mg/kg bw/d	0.13523

	long-term - systemic			
PROC8b	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.137143 mg/kg bw/d	0.006857
PROC8b	Worker - inhalative, short-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC8b	Worker - combined, short-term - systemic	-	4.905 mg/kg bw/d	0.263603
PROC10	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC10	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC10	Worker - combined, long-term - systemic	-	5.042 mg/kg bw/d	0.27046
PROC10	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC10	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC10	Worker - combined, short-term - systemic	-	9.811 mg/kg bw/d	0.527206
PROC11	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.321429 mg/kg bw/d	0.016071
PROC11	Worker - inhalative, long-term - systemic	130 mg/m³	71.54 mg/m³	0.550308
PROC11	Worker - combined, long-term - systemic	-	10.541 mg/kg bw/d	0.566379
PROC11	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.321429 mg/kg bw/d	0.016071
PROC11	Worker - inhalative, short-term - systemic	130 mg/m³	71.54 mg/m³	0.550308
PROC11	Worker - combined, short-term - systemic	-	10.541 mg/kg bw/d	0.566379
PROC13	Worker - dermal, long-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC13	Worker - inhalative, long-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC13	Worker - combined, long-term - systemic	-	12.279 mg/kg bw/d	0.650635
PROC13	Worker - dermal, short-term - systemic	20 mg/kg bw/d	2.743 mg/kg bw/d	0.137143
PROC13	Worker - inhalative, short-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC13	Worker - combined, short-term - systemic	-	4.65 mg/kg bw/d	0.239841

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC0 - Other Products Solvent	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
PC0 - Other Products Solvent	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01

PC0 - Other Products Solvent	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.46E-3 mg/kg bw/d	<0.01
PC0 - Other Products Solvent	-	Man via environment - Oral	-	-	<0.01
Total releases to the environment per year from all life cycle stages					
Water	4.11E8 kg/year				
Air	2.05E8 kg/year				
Soil	8.8E7 kg/year				

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic	26 mg/kg bw/d	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation, Local	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Oral	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES12 - Widespread use by professional workers - Use as laboratory reagent/agent (use in professional settings)

Section 1 - Title

Title	ES12 - Widespread use by professional workers - Use as laboratory reagent/agent (use in professional settings)
Environmental release category(ies)	- ERC8a - Wide dispersive indoor use of processing aids in open systems
Specific Environmental Release Category	- ESVOC SPERC 8.17.v3
Process category(ies)	- PROC10 - Roller application or brushing - PROC15 - Use as laboratory reagent
Product category(ies)	- PC21 - Laboratory chemicals

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
Specific Environmental Release Category - ESVOC SPERC 8.17.v3

Amounts used	
Value	10%
Remarks	Percentage of EU tonnage used at regional scale

Value	0.05%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤0.034
Units	t(ons)/day
Remarks	Daily local widespread use amount

Value	2.5E5
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	32%, - kg/day
Release fraction to wastewater from process (initial release prior to RMM)	15%, 5.138 kg/day

Release fraction to soil from process (initial release prior to RMM)	1%, - kg/day
Release fraction to wastewater from wide dispersive use	50%
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Remarks	Biological STP: Standard: Effectiveness Water: 87.38%

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and/or the established practices; RMM limiting release to water: The release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m3/day; Emissions to soil are minimized when the product is used in accordance with the manufacturers' instructions and / or the established practices

Conditions and measures related to external treatment of waste for disposal	
Waste treatment methods	Unused and spent products and solutions should be appropriately labelled and stored for eventual recovery or disposal as hazardous waste. A suitable unbreakable and closable container should be used when storing and shipping hazardous materials. The containers must be solvent compatible, leakproof, and free of any defects. Contaminated debris such as disposable paper towels, brushes, rollers, masks, transfer vessels, and wipes that may contain small amounts of solvent residue need to be handled as hazardous waste and properly disposed of in a manner that is consistent with local, regional, and national regulations. Direct disposal of waste into a municipal sewer system needs to conform with all applicable laws and regulations. A spill plan needs to be available that outlines the steps to be taken to minimize any potential health and environmental threats

Section 2.2 - Control of worker exposure

Control of worker exposure

Process category(ies)	**PROC10 - Roller application or brushing** **PROC15 - Use as laboratory reagent**
Exposure route	Dermal: Long-term systemic, Short-term systemic Inhalation: Long-term systemic, Short-term systemic
Covers concentrations up to	PROC10: 5% PROC15: 100%
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Exposure duration	> 4 hours / day
Use frequency	Covers frequency up to 5 days per week
Human factors not influenced by risk management	Exposed skin surface assumed: PROC10: 960 cm² PROC15: 240 cm²
Technical conditions and measures to control dispersion from source towards the worker	PROC10: No specific measures identified PROC15: Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	PROC10, PROC15: Respiratory protection not applicable Gloves: APF5 80%
Organisational measures to prevent /limit releases, dispersion and exposure	None

Indoor/Outdoor use	Indoor
Operational conditions	Professional

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 8.17.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term

Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³
Man via the environment - Oral - Systemic	4 mg/kg bw/d
Man via the environment - Inhalation - Systemic	26 mg/m³
Man via the environment - Inhalation - Local	26 mg/m³

Derived No Effect Level (DNEL) **Short term**

Dermal	20 mg/kg bw/d
Inhalation	130 mg/m³

Calculation method EasyTRA

Exposure route Worker - all relevant routes

Exposure estimation

Process category(ies)	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)
PROC10	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC10	Worker - inhalative, long-term - systemic	130 mg/m³	33.377 mg/m³	0.256746
PROC10	Worker - combined, long-term - systemic	-	5.042 mg/kg bw/d	0.27046
PROC10	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.274286 mg/kg bw/d	0.013714
PROC10	Worker - inhalative, short-term - systemic	130 mg/m³	66.754 mg/m³	0.513492
PROC10	Worker - combined, short-term - systemic	-	9.811 mg/kg bw/d	0.527206
PROC15	Worker - dermal, long-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative, long-term - systemic	130 mg/m³	13.351 mg/m³	0.102698
PROC15	Worker - combined, long-term - systemic	-	1.976 mg/kg bw/d	0.106127
PROC15	Worker - dermal, short-term - systemic	20 mg/kg bw/d	0.068571 mg/kg bw/d	0.003429
PROC15	Worker - inhalative,	130 mg/m³	26.702 mg/m³	0.205397

	short-term - systemic			
PROC15	Worker - combined, short-term - systemic	-	3.883 mg/kg bw/d	0.208825

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC21 - Laboratory chemicals	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
PC21 - Laboratory chemicals	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
PC21 - Laboratory chemicals	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	0.011 mg/kg bw/d	<0.01
PC21 - Laboratory chemicals	-	Man via environment - Combined routes	-	-	<0.01

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES13 - Use in Cleaning Agents Use in De-icing and Anti-icing agents (consumer use) (spray products)

Section 1 - Title

Title	ES13 - Use in Cleaning Agents Use in De-icing and Anti-icing agents (consumer use) (spray products)
Environmental release category(ies)	- ERC8d - Wide dispersive outdoor use of processing aids in open systems - ERC8a - Wide dispersive indoor use of processing aids in open systems
Specific Environmental Release Category	- ESVOC SPERC 8.14b.v3
Product category(ies)	- PC4 - Anti-freeze and de-icing products - PC35 - Washing and cleaning products (including solvent based products)

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
- ERC8a - Wide dispersive indoor use of processing aids in open systems

Specific Environmental Release Category - ESVOC SPERC 8.14b.v3

Amounts used	
Value	10%
Remarks	Percentage of EU tonnage used at regional scale

Value	0.05%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤0.137
Units	t(ons)/day
Remarks	Daily local widespread use amount

Value	2.5E5
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	2%, - kg/day
Release fraction to wastewater from process (initial release prior to RMM)	71%, 97.62 kg/day

Release fraction to soil from process (initial release prior to RMM)	17%, - kg/day
Release fraction to wastewater from wide dispersive use	10%
Remarks	Outdoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Remarks	Biological STP: Standard: Effectiveness Water: 87.38%

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and/or the established practices; RMM limiting release to water: The release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m3/day; Emissions to soil are minimized when the product is used in accordance with the manufacturers' instructions and / or the established practices

Conditions and measures related to external treatment of waste for disposal	
Waste treatment methods	Unused and spent products and solutions should be appropriately labelled and stored for eventual recovery or disposal as hazardous waste. A suitable unbreakable and closable container should be used when storing and shipping hazardous materials. The containers must be solvent compatible, leakproof, and free of any defects. Contaminated debris such as disposable paper towels, brushes, rollers, masks, transfer vessels, and wipes that may contain small amounts of solvent residue need to be handled as hazardous waste and properly disposed of in a manner that is consistent with local, regional, and national regulations. Direct disposal of waste into a municipal sewer system needs to conform with all applicable laws and regulations. A spill plan needs to be available that outlines the steps to be taken to minimize any potential health and environmental threats.

Section 2.2 - Control of consumer exposure

Control of consumer exposure	
Product (sub) category(ies)	**PC4 - Anti-freeze and de-icing products** **Cleaning** **Short term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Spray cleaner - Application: cleaning
Physical form of product	Liquid
Product characteristics	Spray application: No Product ingredient fraction by weight: 0.590% Molecular weight matrix: 22g/mol Mass transfer weight: 0.413m/min
Amounts used	Inhalation: 16.2g Dermal: 0.160g
Exposure duration	Inhalation: Exposure calculation result type: Mean event concentration Exposure time: 60 minutes Application duration: 10 minutes Dermal: External dose
Release area	1.71E4 cm2 @ 20°C
Covers skin contact area up to	215 cm2
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	15 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2.5 l/h

Product (sub) category(ies)	**PC4 - Anti-freeze and de-icing products Spraying**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Spray cleaner - Application: spraying
Physical form of product	Liquid
Product characteristics	Spray application: Yes Product ingredient fraction by weight: 0.590%
Exposure duration	Inhalation: Exposure calculation result type: Mean event concentration Weight fraction non-volatile: 5 % Maximum diameter: 100 µm Spray duration: 13.8 s Exposure duration: 60 minutes Dermal: External dose Release duration: 28 s
Covers skin contact area up to	2200 cm2
Remarks	Contact rate: 46 mg/min
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	15 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2.5 l/h
Operational conditions	Room height: 2.5 m Mass generation rate: 1.6 g/s Airborne fraction: 10 % Density non-volatile: 1 % Droplet distribution: Normal, mean and standard deviation: 2.4 +/-0.370 µm Cut-off diameter: 15 µm

Product (sub) category(ies)	**PC4 - Anti-freeze and de-icing products Cleaning Long term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Spray cleaner - Application: cleaning
Physical form of product	Liquid
Product characteristics	Spray application: No Product ingredient fraction by weight: 0.590 % Molecular weight matrix: 22 g/mol Mass transfer weight: 0.413 m/min.
Amounts used	Inhalation: 16.2 g Dermal: 0.310 g
Exposure duration	Inhalation: Exposure calculation result type: Mean concentration on day of exposure Exposure time: 60 minutes Application duration: 10 minutes Dermal: Internal dose chronic
Use frequency	365 days per year
Release area	1.71E4 cm2 @ 20°C
Covers skin contact area up to	225 cm2
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	15 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2.5 l/h
Operational conditions	Dermal: Uptake fraction: 100 %

Product (sub) category(ies)	**PC4 - Anti-freeze and de-icing products Spraying Long term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Spray cleaner - Application: spraying
Physical form of product	Liquid
Product characteristics	Spray application: Yes Product ingredient fraction by weight: 0.590 %
Exposure duration	Inhalation: Exposure calculation result type: Mean concentration on day of exposure Weight fraction non-volatile: 5 % Maximum diameter: 100 µm Spray duration: 13.8 s Exposure duration: 60 minutes Dermal: Release duration: 28 s
Use frequency	365 days per year
Covers skin contact area up to	2200 cm2
Remarks	Contact rate: 46 mg/min.
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	15 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2.5 l/h
Operational conditions	Inhalation: Room height: 2.5 m Mass generation rate: 0.800 g/s Airborne fraction: 20 % Density non-volatile: 1 % Droplet distribution: Normal, mean and standard deviation: 2.4 +/- 0.370 µm Cut-off diameter: 15 µm Dermal: Uptake fraction: 100 %

Product (sub) category(ies)	**PC35 - Washing and cleaning products (including solvent based products) Cleaning Short term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Spray cleaner - Application: cleaning
Physical form of product	Liquid
Product characteristics	Spray application: No Product ingredient fraction by weight: 1 % Molecular weight matrix: 22 g/mol Mass transfer weight: 0.413 m/min.
Amounts used	Inhalation: 16.2 g Dermal: 0.310 g
Exposure duration	Inhalation: Exposure calculation result type: Mean event concentration Exposure time: 60 minutes Application duration: 10 minutes Dermal: External dose
Release area	1.71E4 cm2 @ 20°C
Covers skin contact area up to	225 cm2
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	15 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2.5 l/h

Product (sub) category(ies)	**PC35 - Washing and cleaning products (including solvent based products)** **Spraying** **Short term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Spray cleaner - Application: spraying
Physical form of product	Liquid
Product characteristics	Spray application: Yes Product ingredient fraction by weight: 1 %
Exposure duration	Inhalation: Exposure calculation result type: Mean event concentration Weight fraction non-volatile: 5% Maximum diameter: 100 µm Spray duration: 13.8 s Exposure duration: 60 minutes Dermal: External dose Release duration: 28 s
Covers skin contact area up to	2200 cm2
Remarks	Contact rate: 46 mg/min
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	15 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2.5 l/h
Operational conditions	Inhalation: Room height: 2.5 m Mass generation rate: 1.6 g/s Airborne fraction: 10 % Density non-volatile: 1 % Droplet distribution: LogNormal, median and coefficient of variation: 2.4 +/- 0.370 µm Cut-off diameter: 15 µm

Product (sub) category(ies)	**PC35 - Washing and cleaning products (including solvent based products)** **Cleaning** **Long term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Spray cleaner - Application: cleaning
Physical form of product	Liquid
Product characteristics	Spray application: No Product ingredient fraction by weight: 5 % Molecular weight matrix: 22 g/mol Mass transfer weight: 0.413 m/min.
Amounts used	Inhalation: 16.2 g Dermal. 0.310 g
Exposure duration	Inhalation: Exposure calculation result type. Mean concentration on day of exposure Exposure time: 60 minutes Application duration. 10 minutes Dermal: Internal dose chronic
Use frequency	365 days per year
Release area	1.71E4 cm2 @ 20°C
Covers skin contact area up to	225 cm2
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	15 m3
Minimum room ventilation rate for handling/application (air changes per	2.5 l/h

hour)	
Operational conditions	Dermal: Uptake fraction: 100 %

Product (sub) category(ies)	**PC35 - Washing and cleaning products (including solvent based products) Spraying Long term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Spray cleaner - Application: spraying
Physical form of product	Liquid
Product characteristics	Spray application: Yes Product ingredient fraction by weight: 5 %
Exposure duration	Inhalation: Exposure calculation result type: Mean concentration yearly Weight fraction non-volatile: 5 % Maximum diameter: 100 µm Spray duration: 13.8 s Exposure duration: 60 minutes Dermal: Internal dose chronic Release duration: 2824.6 s
Use frequency	365 days per year
Covers skin contact area up to	2200 cm2
Remarks	Contact rate: 46 mg/min
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	15 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2.5 l/h
Operational conditions	Inhalation: Room height: 2.5 m Mass generation rate: 1.6 g/s Airborne fraction: 10 % Density non-volatile: 1 % Droplet distribution: LogNormal, median and coefficient of variation: 2.4 +/- 0.370 µm Cut-off diameter: 15 µm Dermal: Uptake fraction: 100 %

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 8.14b.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term.

Dermal 4 mg/kg bw/d

Inhalation 26 mg/m^3

Man via the environment - Oral - Systemic 4 mg/kg bw/d

Man via the environment - Inhalation - Systemic	26 mg/m³
Man via the environment - Inhalation - Local	26 mg/m³
Derived No Effect Level (DNEL)	**Short term**
Dermal	4 mg/kg bw/d
Inhalation	26 mg/m^3

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

Exposure route Consumer - all relevant routes

Exposure estimation

Product category(ies)	Sector(s) of use	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: cleaning	-	Consumer - dermal, short-term - systemic	4 mg/kg bw/d	0.014523 mg/kg bw/d	0.003631
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: cleaning	-	Consumer - inhalative, short-term - systemic	26 mg/m³	2.339 mg/m³	0.089957
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: cleaning	-	Consumer - combined, short-term - systemic	-	0.06385 mg/kg bw/d	0.093588
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: spraying	-	Consumer - dermal, short-term - systemic	4 mg/kg bw/d	0.001841 mg/kg bw/d	0.00046
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: spraying	-	Consumer - inhalative, short-term - systemic	26 mg/m³	0.295756 mg/m³	0.011375
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: spraying	-	Consumer - combined, short-term - systemic	-	0.007734 mg/kg bw/d	0.011835
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: cleaning	-	Consumer - dermal, long-term - systemic	4 mg/kg bw/d	0.02658 mg/kg bw/d	0.006646
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: cleaning	-	Consumer - inhalative, long-term - systemic	26 mg/m³	0.097454 mg/m³	0.003748
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: cleaning	-	Consumer - combined, long-term - systemic	-	0.028526 mg/kg bw/d	0.010394
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: spraying	-	Consumer - dermal, long-term - systemic	4 mg/kg bw/d	0.001841 mg/kg bw/d	0.00046
PC4 - Anti-freeze and de-icing products Spray cleaner - Application: spraying	-	Consumer - inhalative, long-term - systemic	26 mg/m³	0.12323 mg/m³	0.000474
PC4 - Anti-freeze and	-	Consumer -	-	0.002086 mg/kg	0.000934

de-icing products Spray cleaner - Application: spraying		combined, long-term - systemic		bw/d	
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: cleaning	-	Consumer - dermal, short-term - systemic	4 mg/kg bw/d	0.045058 mg/kg bw/d	0.011265
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: cleaning	-	Consumer - inhalative, short-term - systemic	26 mg/m³	3.964 mg/m³	0.15247
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: cleaning	-	Consumer - combined, short-term - systemic	-	0.124045 mg/kg bw/d	0.163734
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: spraying	-	Consumer - dermal, short-term - systemic	4 mg/kg bw/d	0.00312 mg/kg bw/d	0.00078
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: spraying	-	Consumer - inhalative, short-term - systemic	26 mg/m³	0.493621 mg/m³	0.018985
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: spraying	-	Consumer - combined, short-term - systemic	-	0.012955 mg/kg bw/d	0.019765
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: cleaning	-	Consumer - dermal, long-term - systemic	4 mg/kg bw/d	0.225291 mg/kg bw/d	0.056323
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: cleaning	-	Consumer - inhalative, long-term - systemic	26 mg/m³	0.825882 mg/m³	0.031765
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: cleaning	-	Consumer - combined, long-term - systemic	-	0.241746 mg/kg bw/d	0.088087
PC35 - Washing and cleaning products (including solvent based	-	Consumer - dermal, long-term - systemic	4 mg/kg bw/d	1.574 mg/kg bw/d	0.393446

products) Spray cleaner - Application: spraying					
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: spraying	-	Consumer - inhalative, long-term - systemic	26 mg/m³	0.102838 mg/m³	0.003955
PC35 - Washing and cleaning products (including solvent based products) Spray cleaner - Application: spraying	-	Consumer - combined, long-term - systemic	-	1.576 mg/kg bw/d	0.397401

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC4 - Anti-freeze and de-icing products PC35 - Washing and cleaning products (including solvent based products)	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.6E-3 mg/m³	<0.01
PC4 - Anti-freeze and de-icing products PC35 - Washing and cleaning products (including solvent based products)	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.6E-3 mg/m³	<0.01
PC4 - Anti-freeze and de-icing products PC35 - Washing and cleaning products (including solvent based products)	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	0.037 mg/kg bw/d	<0.01
PC4 - Anti-freeze and de-icing products PC35 - Washing and cleaning products (including solvent based products)	-	Man via environment - Combined routes	-	-	<0.01

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure	4 mg/kg bw/d	9.35E-3 mg/m³	<0.01

via food consumption			
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Inhalation, Local	26 mg/m³	PEC: 5.63E-3 mg/m³	<0.01
Man via environment - Oral	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES14 - Use in Cleaning Agents Use in De-icing and Anti-icing agents (consumer use) (liquid products)

Section 1 - Title

Title	ES14 - Use in Cleaning Agents Use in De-icing and Anti-icing agents (consumer use) (liquid products)
Environmental release category(ies)	- ERC8d - Wide dispersive outdoor use of processing aids in open systems - ERC8a - Wide dispersive indoor use of processing aids in open systems
Specific Environmental Release Category	- ESVOC SPERC 8.14b.v3
Product category(ies)	- PC4 - Anti-freeze and de-icing products - PC35 - Washing and cleaning products (including solvent based products)

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
- ERC8a - Wide dispersive indoor use of processing aids in open systems

Specific Environmental Release Category - ESVOC SPERC 8.14b.v3

Amounts used	
Value	10%
Remarks	Percentage of EU tonnage used at regional scale

Value	0.05%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤0.137
Units	t(ons)/day
Remarks	Daily local widespread use amount

Value	2.5E5
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	2%, - kg/day
Release fraction to wastewater from process (initial release prior to RMM)	71%, 97.62 kg/day

Release fraction to soil from process (initial release prior to RMM)	17%, - kg/day
Release fraction to wastewater from wide dispersive use	10%
Remarks	Outdoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Remarks	Biological STP: Standard: Effectiveness Water: 87.38%

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and/or the established practices; RMM limiting release to water: The release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m3/day; Emissions to soil are minimized when the product is used in accordance with the manufacturers' instructions and / or the established practices

Conditions and measures related to external treatment of waste for disposal	
Waste treatment methods	Unused and spent products and solutions should be appropriately labelled and stored for eventual recovery or disposal as hazardous waste. A suitable unbreakable and closable container should be used when storing and shipping hazardous materials. The containers must be solvent compatible, leakproof, and free of any defects. Contaminated debris such as disposable paper towels, brushes, rollers, masks, transfer vessels, and wipes that may contain small amounts of solvent residue need to be handled as hazardous waste and properly disposed of in a manner that is consistent with local, regional, and national regulations. Direct disposal of waste into a municipal sewer system needs to conform with all applicable laws and regulations. A spill plan needs to be available that outlines the steps to be taken to minimize any potential health and environmental threats

Section 2.2 - Control of consumer exposure

Control of consumer exposure	
Product (sub) category(ies)	**PC4 - Anti-freeze and de-icing products Short term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Liquid cleaner – Application
Physical form of product	Liquid
Product characteristics	Spray application: No Product ingredient fraction by weight: 0.590 % Molecular weight matrix: 18 g/mol Mass transfer weight: 0.413 m/min.
Amounts used	Inhalation: 100 g Dermal: 5 g
Exposure duration	Inhalation Exposure calculation result type: Mean event concentration Exposure time: 240 minutes Application duration: 20 minutes Dermal: External dose
Release area	3.20E4 cm2 @ 20°C
Covers skin contact area up to	2200 cm2
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	58 m3
Minimum room ventilation rate for handling/application (air changes per hour)	0.500 l/h

Product (sub) category(ies)	**PC4 - Anti-freeze and de-icing products Long term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Liquid cleaner – Application
Physical form of product	Liquid
Product characteristics	Spray application: No Product ingredient fraction by weight: 0.590 % Molecular weight matrix: 18 g/mol Mass transfer weight: 0.413 m/min.
Amounts used	Inhalation: 100 g Dermal: 5 g
Exposure duration	Inhalation: Exposure calculation result type: Mean concentration on day of exposure Exposure time: 240 minutes Application duration: 20 minutes Dermal: Internal dose chronic
Use frequency	197 days per year
Release area	5.00E4 cm2 @ 20°C
Covers skin contact area up to	2200 cm2
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	58 m3
Minimum room ventilation rate for handling/application (air changes per hour)	0.500 l/h
Operational conditions	Dermal: Uptake fraction: 100 %

Product (sub) category(ies)	**PC35 - Washing and cleaning products (including solvent based products) Short term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise indicated Liquid cleaner – Application
Physical form of product	Liquid
Product characteristics	Spray application: No Product ingredient fraction by weight: 1 % Molecular weight matrix: 18 g/mol Mass transfer weight: 0.170 m/min.
Amounts used	Inhalation: 100 g Dermal: 5 g
Exposure duration	Inhalation: Exposure calculation result type: Mean event concentration Exposure time: 240 minutes Application duration: 20 minutes Dermal: External dose
Release area	3.20E5 cm2 @ 20°C
Covers skin contact area up to	2200 cm2
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	58 m3
Minimum room ventilation rate for handling/application (air changes per hour)	0.500 l/h

Product (sub) category(ies)	**PC35 - Washing and cleaning products (including solvent based products) Long term**
Calculation method	The Consexpo model has been used to estimate consumer exposures unless otherwise

	indicated Liquid cleaner – Application
Physical form of product	Liquid
Product characteristics	Spray application: No Product ingredient fraction by weight: 1 % Molecular weight matrix: 18 g/mol Mass transfer weight: 0.413 m/min.
Amounts used	Inhalation: 100 g Dermal: 5 g
Exposure duration	Inhalation: Exposure calculation result type: Mean concentration on day of exposure Exposure time: 240 minutes Application duration: 20 minutes Dermal: Internal dose chronic
Use frequency	197 days per year
Release area	3.20E5 cm2 @ 20°C
Covers skin contact area up to	2200 cm2
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	58 m3
Minimum room ventilation rate for handling/application (air changes per hour)	0.500 l/h
Operational conditions	Dermal: Uptake fraction: 100 %

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 8.14b.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term.

Dermal	4 mg/kg bw/d
Inhalation	26 mg/m^3
Man via the environment - Oral - Systemic	4 mg/kg bw/d
Man via the environment - Inhalation - Systemic	26 mg/m³
Man via the environment - Inhalation - Local	26 mg/m³

Derived No Effect Level (DNEL) **Short term**

Dermal	4 mg/kg bw/d
Inhalation	26 mg/m^3

Calculation method The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated

Exposure route Consumer - all relevant routes

Exposure estimation

Product category(ies)	Sector(s) of use	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation

					ratio (RCR)
PC4 - Anti-freeze and de-icing products Liquid cleaner – Application	-	Consumer - dermal, short-term - systemic	4 mg/kg bw/d	0.428779 mg/kg bw/d	0.107195
PC4 - Anti-freeze and de-icing products Liquid cleaner – Application	-	Consumer - inhalative, short-term - systemic	26 mg/m³	4.333 mg/m³	0.166671
PC4 - Anti-freeze and de-icing products Liquid cleaner – Application	-	Consumer - combined, short-term - systemic	-	0.774154 mg/kg bw/d	0.273866
PC4 - Anti-freeze and de-icing products Liquid cleaner – Application	-	Consumer - dermal, long-term - systemic	4 mg/kg bw/d	0.231423 mg/kg bw/d	0.057856
PC4 - Anti-freeze and de-icing products Liquid cleaner – Application	-	Consumer - inhalative, long-term - systemic	26 mg/m³	0.722239 mg/m³	0.027778
PC4 - Anti-freeze and de-icing products Liquid cleaner – Application	-	Consumer - combined, long-term - systemic	-	0.288985 mg/kg bw/d	0.085634
PC35 - Washing and cleaning products (including solvent based products) Liquid cleaner – Application	-	Consumer - dermal, short-term - systemic	4 mg/kg bw/d	0.726744 mg/kg bw/d	0.181686
PC35 - Washing and cleaning products (including solvent based products) Liquid cleaner – Application	-	Consumer - inhalative, short-term - systemic	26 mg/m³	7.345 mg/m³	0.282494
PC35 - Washing and cleaning products (including solvent based products) Liquid cleaner – Application	-	Consumer - combined, short-term - systemic	-	1.312 mg/kg bw/d	0.46418
PC35 - Washing and cleaning products (including solvent based products) Liquid cleaner – Application	-	Consumer - dermal, long-term - systemic	4 mg/kg bw/d	0.392243 mg/kg bw/d	0.098061
PC35 - Washing and cleaning products (including solvent based products) Liquid cleaner – Application	-	Consumer - inhalative, long-term - systemic	26 mg/m³	1.224 mg/m³	0.047082
PC35 - Washing and cleaning products (including solvent based products) Liquid cleaner –	-	Consumer - combined, long-term - systemic	-	0.489806 mg/kg bw/d	0.145143

Application					

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC4 - Anti-freeze and de-icing products PC35 - Washing and cleaning products (including solvent based products)	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.6E-3 mg/m³	<0.01
PC4 - Anti-freeze and de-icing products PC35 - Washing and cleaning products (including solvent based products)	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.6E-3 mg/m³	<0.01
PC4 - Anti-freeze and de-icing products PC35 - Washing and cleaning products (including solvent based products)	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	0.037 mg/kg bw/d	<0.01
PC4 - Anti-freeze and de-icing products PC35 - Washing and cleaning products (including solvent based products)	-	Man via environment - Combined routes	-	-	<0.01

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral, Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic	26 mg/m³	PEC: 5.6E-3 mg/m³	<0.01
Man via environment - Inhalation, Local	26 mg/m³	PEC: 5.6E-3 mg/m³	<0.01
Man via environment - Oral	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”

Exposure scenario

ES15 - Use as Fuel additive (consumer use) (outdoor use)

Section 1 - Title

Title	ES15 - Use as Fuel additive (consumer use) (outdoor use)
Environmental release category(ies)	- ERC9b - Wide dispersive outdoor use of substances in closed systems
Specific Environmental Release Category	- ESVOC SPERC 9.12c.v3
Product category(ies)	- PC13 - Fuels

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC9b - Wide dispersive outdoor use of substances in closed systems
Specific Environmental Release Category - ESVOC SPERC 9.12c.v3

Amounts used	
Value	10%
Remarks	Percentage of EU tonnage used at regional scale

Value	0.05%
Remarks	Percentage of Regional tonnage used at local scale

Value	≤0.034
Units	t(ons)/day
Remarks	Daily local widespread use amount

Value	2.5E5
Units	t(ons)/year
Remarks	Tonnage per use

Product characteristics	
Physical form of product	Liquid
Vapour pressure	169.2 hPa
Temperature vapour pressure	25°C
Level of dustiness	High
Volatility	High
Remarks	Environmental exposure assessment and risk characterization completed for man via environment

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.4%, - kg/day
Release fraction to wastewater from process (initial release prior to RMM)	2E-5%, 6.85E-6 kg/day
Release fraction to soil from process (initial release prior to RMM)	5E-3%, - kg/day
Release fraction to wastewater from wide dispersive use	2%
Remarks	Indoor use. Outdoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Remarks	Biological STP: Standard: Effectiveness Water: 87.38%

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and/or the established practices; Emissions to soil are minimized when the product is used in accordance with the manufacturers' instructions and / or the established practices; RMM limiting release to water: The release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m3/day

Conditions and measures related to external treatment of waste for disposal	
Waste treatment methods	Although household hazardous waste (HHW) represents a small portion of the total domestic waste produced by consumers, it needs to be separated from normal trash and amassed for special handling. Many regional municipalities have established voluntary procedures for the identification, collection, and disposal of HHW in a safe and efficient manner. Once amassed, the HHW can be transported to collection sites where it is reused, recycled, or incinerated. The handling and disposal of hazardous waste needs to conform with established practices and local/regional regulations in order to minimize environmental release and the potential for ecological harm

Section 2.2 - Control of consumer exposure

Control of consumer exposure	
Product (sub) category(ies)	**PC13 - Fuels Short term**
Physical form of product	Liquid
Product characteristics	Spray application: No Product ingredient fraction by weight: 2 % Molecular weight matrix: 100 g/mol Mass transfer weight: 0.413 m/min.
Amounts used	Inhalation: 10 g Dermal: 10 g
Exposure duration	Inhalation: Exposure calculation result type: Mean event concentration Exposure time: 10 minutes Application duration: 10 minutes Dermal: External dose
Release area	2 cm2 @ 20°C
Covers skin contact area up to	430 cm2
Indoor/Outdoor use	Indoor use. Outdoor use.
Use in room with a volume of minimum	20 m3
Minimum room ventilation rate for handling/application (air changes per hour)	0.500 l/h

Product (sub) category(ies)	**PC13 - Fuels Long term**
Physical form of product	Liquid
Product characteristics	Spray application: No Product ingredient fraction by weight: 3 % Molecular weight matrix: 100 g/mol Mass transfer weight: 0.413 m/min.
Amounts used	Inhalation: 5.00E4 g Dermal: 10 g
Exposure duration	Inhalation: Exposure calculation result type: Mean concentration on day of exposure Exposure time: 10 minutes

	Application duration: 10 minutes Dermal: Internal dose chronic
Use frequency	2 days per week
Release area	2 cm2 @ 20°C
Covers skin contact area up to	430 cm3
Indoor/Outdoor use	Indoor use. Outdoor use.
Use in room with a volume of minimum	20 m3
Minimum room ventilation rate for handling/application (air changes per hour)	0.500 l/h
Operational conditions	Dermal: Uptake fraction: 100 %

Section 3 - Exposure estimation

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

Specific Environmental Release Category - ESVOC SPERC 9.12c.v3

Predicted No Effect Concentration (PNEC) No hazard identified. With high probability the substance is not hazardous to aquatic life. No environmental risk assessment is necessary.

Calculation method Used EUSES model

Remarks Environmental exposure assessment and risk characterization completed for man via environment

Derived No Effect Level (DNEL) Long term.

Dermal	4 mg/kg bw/d
Inhalation	26 mg/m^3
Man via the environment - Oral - Systemic	4 mg/kg bw/d
Man via the environment - Inhalation - Systemic	26 mg/m³
Man via the environment - Inhalation - Local	26 mg/m³

Derived No Effect Level (DNEL) **Short term**

Dermal	4 mg/kg bw/d
Inhalation	26 mg/m^3

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

Exposure route Consumer - all relevant routes

Exposure estimation

Product category(ies)	Sector(s) of use	Exposure route	Derived No Effect Level (DNEL)	Exposure estimation	Risk characterisation ratio (RCR)
PC13 - Fuels	-	Consumer - dermal, short-term - systemic	4 mg/kg bw/d	2.907 mg/kg bw/d	0.726744
PC13 - Fuels	-	Consumer - inhalative, short-term - systemic	26 mg/m³	0.266072 mg/m³	0.010234
PC13 - Fuels	-	Consumer - combined, short-term - systemic	-	2.908 mg/m³	0.736978

PC13 - Fuels	-	Consumer - dermal, long-term - systemic	4 mg/kg bw/d	1.319 mg/kg bw/d	0.32967
PC13 - Fuels	-	Consumer - inhalative, long-term - systemic	26 mg/m³	0.002716 mg/m³	0.000104
PC13 - Fuels	-	Consumer - combined, long-term - systemic	-	1.319 mg/kg bw/d	0.329775

Calculation method Used EUSES model
Exposure route Environment (combined for all emission sources)

Exposure estimation					
Product category(ies)	**Sector(s) of use**	**Protection target**	**Derived No Effect Level (DNEL)**	**Exposure estimation**	**Risk characterisation ratio (RCR)**
PC13 - Fuels	-	Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
PC13 - Fuels	-	Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
PC13 - Fuels	-	Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.46E-3 mg/kg bw/d	<0.01
PC13 - Fuels	-	Man via environment - Combined routes	-	-	<0.01

Total releases to the environment per year from all life cycle stages	
Water	4.11E8 kg/year
Air	2.05E8 kg/year
Soil	8.8E7 kg/year

Predicted regional exposure concentrations (Regional PEC) and risks for the environment			
Protection target	**Derived No Effect Level (DNEL)**	**Regional PEC**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	5.56E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	9.35E-3 mg/kg bw/d	<0.01
Man via environment - Combined routes	-	-	<0.01
Predicted exposure concentrations and risks for the environment and man via the environment due to all widespread uses			
Protection target	**Derived No Effect Level (DNEL)**	**PEC local due to widespread uses**	**Risk characterisation ratio (RCR)**
Man via environment - Inhalation, Systemic; Concentration in air	26 mg/m³	PEC: 5.6E-3 mg/m³	<0.01
Man via environment - Inhalation, Local; Concentration in air	26 mg/m³	PEC: 5.6E-3 mg/m³	<0.01
Man via environment - Oral; Exposure via food consumption	4 mg/kg bw/d	PEC: 0.067 mg/kg bw/d	0.017
Man via environment - Combined routes	-	-	0.017

Section 4 - Guidance to check compliance with the exposure scenario

ECHA guidance for downstream users

Scaling method	The quantitative risk characterization for this worker exposure has been calculated by EasyTRA
Scalable parameters	Exposure duration and maximum concentration All other parameters have to be taken directly from the exposure scenario provided
Boundaries of scaling	RCR combined is calculated following the recommendation in the ECHA guidance document “Guidance on information requirements and chemical safety assessment – Part E: Risk characterization”