Product	Xylenes
Revision date	23 September 2020
Revision	2

Safety Data Sheet (SDS)

according to Regulation (EC) No. 1907/2006

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

1.1 Product identifier

Product name	**Xylenes**
Synonyms, Trade names	Premium Industrial Thinners (Xylene)
EC number	215-535-7
CAS number	1330-20-7
REACH number	01-2119488216-32-XXXX

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

Identified uses	Used mainly as a thinner for paints containing xylene. Also used as a cleaner/degreaser on steel. For industrial and professional use only.
Uses advised against	No uses advised against are identified.

1.3 Details of the supplier of the safety data sheet

Supplier	Castle Paints Ltd Cloncollig Industrial Estate Tullamore Offaly R35 X993 Ireland Tel: 353 (0)579351583
Contact person	info@castlepaints.ie

1.4 Emergency telephone number

Emergency telephone	Emergency medical information: 8am - 10pm (Seven Days) contact National Poison Center,Beaumont Hospital. Telephone: +353 (0) 18092166

Section 2: Hazards identification

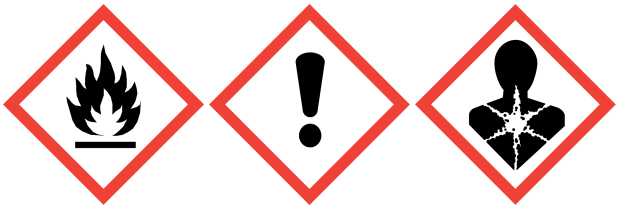
2.1 Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and chemical hazards	Flam. Liq 3- H226
Human health	STOT SE 3 - H335, Acute Tox 4 - H312, Acute Tox 4 - H332, Skin Irrit.2 - H315, Eye Irrit.2A - H319, STOT RE 2 - H373, Asp. Tox - H304
Environment	Aquatic Chronic 3 - H412

2.2 Label elements

Label in accordance with (EC) no. 1272/2008



Signal word

Danger

Hazard statements

H226 Flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H312 Harmful in contact with skin.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.

H335 May cause respiratory irritation.
H373 May cause damage to organs through prolonged or repeated exposure.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention
P210 Keep away from heat/ sparks/open flames/hot surfaces. — No smoking.
P260 Do not breathe dust/fume/ gas/mist/vapours/spray.
P280 Wear protective gloves/ protective clothing/eye protection/face protection.
Response
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331 Do NOT induce vomiting.
P370 + P378 In case of fire: Use water spray, carbon dioxide, dry chemical or foam for extinction.
Storage
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

2.3 Other hazards

None known.

Section 3: Composition/identification of ingredients

3.1 Substance

Name	Product identifier	Regulation (EC) No 1272/2008	%
Xylene	CAS-No.: 1330-20-7 EC No.: 215-535-7 REACH Reg No.: 01-2119488216-32-xxxx	Acute Tox 4 - H312, Acute Tox 4 - H332, Skin Irrit.2 - H315, Eye Irrit.2A - H319, STOT SE 3 - H335, STOT RE 2 - H373, Asp. Tox - H304, Flam. Liq 3- H226, Aquatic Chronic 3 - H412	> 80-100%
ethylbenzene	CAS-No.: 100-41-4 EC No.: 202-849-4	Flam. Liq 2- H225, Asp. Tox - H304, Acute Tox 4 - H332, STOT RE 2 - H373	10-< 20%
toluene	CAS-No.: 108-88-3 EC No.: 203-625-9	Flam. Liq 2- H225, Asp. Tox - H304, Skin Irrit.2 - H315, STOT SE 3 - H336, Repr. 2 - H361d, STOT RE 2 - H373	1-< 2%

The full text for all hazard statements are displayed in section 16.

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

3.2 Mixtures

Not applicable.

Section 4: First aid measures

4.1 Description of first aid measures

General information Provide general first aid, rest, warmth and fresh air. As a general rule, in case of doubt or if symptoms persist, always call a doctor. Seek medical attention for all burns and eye injuries, regardless how minor they may seem. First aid personnel must be aware of own risk during rescue.

Inhalation If this product is inhaled and symptoms occur, move the exposed person to fresh air promptly. If breathing has stopped or the exposed person experiences difficulty in breathing, administer artificial respiration and seek immediate medical assistance.

Ingestion If this product is ingested, remove victim immediately from source of exposure. Thoroughly rinse the mouth with water. Do not induce vomiting. If swallowed, seek medical advice immediately and show the container or label. If vomiting occurs, keep head low so that stomach content doesn't enter the lungs. Never give anything by mouth to an unconscious person.

Skin contact Remove affected person from source of contamination. Remove contaminated clothing. Wash exposed area with soap and water. Continue to rinse for at least 15 minutes. Seek medical advice.

Eye contact Avoid contaminating unaffected eye. Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Remove contact lenses if present and easy to do so. Continue to rinse for at least 15 minutes. Get prompt medical attention.

4.2 Most important symptoms and effects, both acute and delayed

General information The severity of the symptoms described will vary dependent on the concentration and the

	length of exposure. May cause damage to organs through prolonged or repeated exposure.
Inhalation	Harmful if inhaled. May cause respiratory tract irritation. Symptoms may include: Irritation, headache, dizziness, nausea, mental confusion, or unconsciousness.
Ingestion	May cause gastrointestinal irritation, nausea, vomiting and diarrhoea. May be fatal if swallowed and enters airways.
Skin contact	Harmful in contact with skin. Causes skin irritation.
Eye contact	Causes serious eye irritation. May cause redness, swelling, pain and tearing.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to the physician	Treat symptomatically.

Section 5: Fire-fighting measures

5.1 Extinguishing media

Extinguishing media	Use fire-extinguishing media appropriate for surrounding materials. Dry chemical, foam or carbon dioxide.
Unsuitable extinguishing media	High volume water jet.

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products	When heated or in case of fire, vapours/gases hazardous to health may be formed. Combustion products may include and are not limited to: Oxides of carbon. Unburned hydrocarbons (smoke).
Unusual fire & explosion hazards	The product is classified as a flammable liquid and vapour. Vapours are heavier than air and may spread near ground to sources of ignition. Do not allow to enter drains, sewers, basements and workpits, or any place where its accumulation can be dangerous. Vapours may form explosive mixture with air. Vapour may travel considerable distance to source of ignition and flash back.
Specific hazards	When heated and in case of fire, harmful vapours/gases may be formed. In a fire or if heated, a pressure increase will occur and the container may burst. Do not allow run-off from fire fighting to enter drains or water courses.

5.3 Advice for firefighters

Special fire fighting procedures	Ventilate closed spaces before entering them. Water spray should be used to cool containers. If possible, fight fire from protected position. Keep up-wind to avoid fumes. Containers close to fire should be removed immediately or cooled with water if safe to do so.
Protective equipment for firefighters	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Wear protective clothing as described in Section 8 of this safety data sheet. Eliminate all sources of ignition. Avoid inhalation of vapours and contact with skin and eyes. Provide adequate ventilation. In case of inadequate ventilation, use respiratory protection. Keep unnecessary and unprotected personnel from entering. Read and follow manufacturer's recommendations.
For emergency responders	Follow safe handling advice and personal protective equipment recommendations for normal use of product.

6.2 Environmental precautions

Environmental precautions	Do not allow to enter sewers/ surface or ground water. Spillages or uncontrolled discharges into watercourses must be IMMEDIATELY alerted to the Environmental Agency or other appropriate regulatory body.

6.3 Methods and material for containment and cleaning up

Spill clean up methods	DO NOT TOUCH SPILLED MATERIAL Wear appropriate personal protective equipment as specified in Section 8. Eliminate all sources of ignition. Ventilate and evacuate the area. Cover drains. Prevent further leakage or spillage if safe to do so.

Use non sparking tools or equipment for clean up. Absorb spillage with inert, damp, non-combustible material or use a liquid binding material. Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in a suitably labelled container. Wash thoroughly after dealing with a spillage.

6.4 Reference to other sections

Reference to other sections See section 1 for emergency contact. For personal protection, see section 8. For waste disposal, see section 13.

Section 7: Handling and storage

7.1 Precautions for safe handling

Handling Provide good ventilation. Wear suitable personal protective equipment, as detailed in Section 8. Avoid inhalation of vapours and contact with skin and eyes. Keep away from ignition sources. Take precautionary measures against static discharges. Use non sparking tools. Read and follow manufacturer's recommendations. Avoid prolonged or repeated contact. Do not wear contact lenses.

7.2 Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly closed original container in a dry, cool and well-ventilated place. Keep away from incompatible materials (see section 10). Containers once opened must be carefully resealed to prevent leakage. Prohibit ignition sources close to storage area. To avoid static electricity, ground equipment.

Storage class Flammable liquid storage.

7.3 Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

Usage description Use only according to directions. Replace and tighten cap after use.

Section 8: Exposure controls/Personal protection

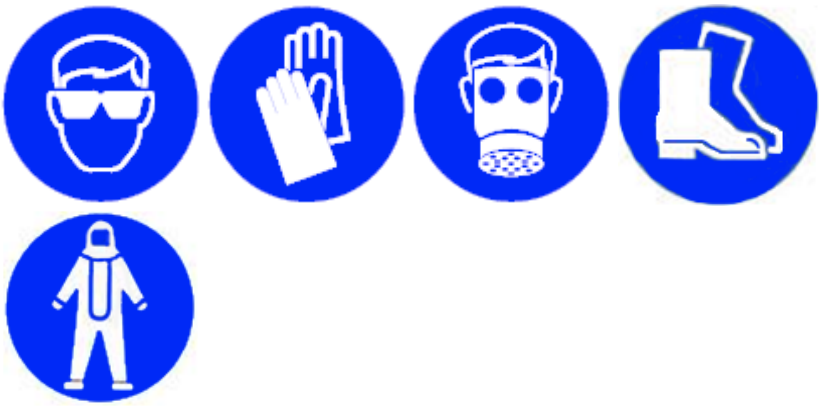
8.1 Control parameters

Component	STD	TWA (8 Hrs)		STEL (15mins)		Notes
Xylene	OEL	50 ppm	221 mg/m^3	100 ppm	442 mg/m^3	Mixed isomers. Sk, IOELV.
ethylbenzene	OEL	100 ppm	442 mg/m^3	200 ppm	884 mg/m^3	Sk, IOELV.
toluene	OEL	50 ppm	192 mg/m^3	100 ppm	384 mg/m^3	Sk, IOELV.

Ingredient comments Ireland, Occupational Exposure Limits 2020.
XYLENES DNEL:
(WORKERS)
Inhalation - Short term - systemic effects: 289 mg/m³.
Inhalation - Short term - local effects: 289 mg/m³.
Dermal - Long term - systemic effects: 180 mg/kg bw/day.
Inhalation - Long term - systemic effects: 77 mg/m³.
Inhalation - Long term - local effects: 77 mg/m³.
(GENERAL POPULATION)
Inhalation - Short term - systemic effects: 174 mg/m³.
Inhalation - Short term - local effects: 174 mg/m³.
Oral - Long term - systemic effects: 1.6 mg/kg bw/day.
Inhalation - Long term - systemic effects: 14.8 mg/m³.
Dermal - Long term - systemic effects: 108 mg/kg bw/day.
XYLENES PNEC:
Fresh Water: 0.327 mg/l.
Freshwater sediment: 12.46 mg/kg dw.
Soil: 2.31 mg/kg dw.
Sewage treatment plant: 6.58 mg/l.

8.2 Exposure Controls

Protective equipment



Engineering measures	Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Where necessary use lighting and electrical equipment designed for use in atmospheres where flammable vapours are present, and which can direct static electricity by grounding equipment.
Respiratory equipment	If ventilation is inadequate, suitable respiratory protection must be worn. EN 136/140/145/143/149. If the respirator is the sole means of protection, use a supplied air self contained breathing apparatus operated in positive pressure mode. Suggested PPE: Positive pressure self-contained breathing apparatus (EN137: 2006). Respirator with a full face mask (EN 136). Respirator with a half face mask (EN 140). Recommended Filter type: A/P (EN 141). Change filters frequently. Use respirators and components tested and approved under appropriate government standards such as CEN (EU). Use respiratory protection as specified by an industrial hygienist or other qualified professional.
Hand protection	Selection of the glove material depends on consideration of the penetration times, rates of diffusion and degradation, and concentration specific to the workplace. Where hand contact with the product may occur use gloves approved to relevant standards (e.g. Europe: EN374.) Gloves must be inspected prior to use. Suggested material: (Suitable materials for longer, direct contact) Viton. Polyvinyl alcohol (PVA). Breakthrough time: >480 minutes. (Suitable materials for short-term contact or splashes) Nitrile rubber. Minimum layer thickness: >0.45 mm. Breakthrough time: > 30 minutes. Consult manufacturer for specific advice on material. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.
Eye protection	Wear safety goggles or face shield to prevent any possibility of eye contact. Use equipment for eye protection tested and approved under appropriate government standards such as EN 166(EU).
Other protection	Wear appropriate clothing to prevent any possibility of skin contact. Fire/chemical resistant full-length overalls and boots. Protective clothing should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. The selected clothing must satisfy the European norm standard EN 943.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice. Wash promptly if skin becomes contaminated. Remove contaminated clothing and protective equipment before entering eating areas. Immediately take off any contaminated clothing and launder before re-use. Wash hands at the end of each work shift and before eating, smoking and using the toilet
Process conditions	Ensure that eye flushing systems and safety showers are located close by in the work place.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Colourless. Clear.
Odour	Aromatic.
Odour threshold - lower	No information available as testing has not been completed.
Odour threshold - upper	No information available as testing has not been completed.
pH-Value, Conc. Solution	No information available as testing has not been completed.
pH-Value, Diluted solution	No information available as testing has not been completed.

Melting point	- 95 to 13 °C
Initial boiling point and boiling range	139.6 to 152 °C
Flash point	> 23.00 °C
Evaporation rate	No information available as testing has not been completed.
Flammability state	Flammable liquid and vapour.
Flammability limit - lower(%)	0.80
Flammability limit - upper(%)	6.70
Vapour pressure	6,5 - 9,5 hPa @ 20°C
Vapour density (air=1)	No information available as testing has not been completed.
Relative density	0.86 to 0.88 g/cm³ at 25°C (literature value).
Bulk density	No information available as testing has not been completed.
Solubility	Soluble in organic solvents. Water solubility: 146 - 191 mg/l @ 25 °C.
Decomposition temperature	No information available as testing has not been completed.
Partition coefficient; n-Octanol/Water	log kow 3,1 - 3,2
Auto ignition temperature (°C)	432 - 528 °C
Viscosity	< 0,9 mm²/s (20°C)
Explosive properties	The study does not need to be conducted because there are no chemical groups associated with explosive properties present in the molecule.
Oxidising properties	The product does not meet the criteria to be classified as oxidising.

9.2 Other information

Molecular weight	No information available as testing has not been completed.
Volatile organic compound	No information available as testing has not been completed.
Other information	None noted.

Section 10: Stability and reactivity

10.1 Reactivity

Reactivity	Flammable liquid and vapour. Vapours may form explosive mixture with air. Reacts with strong mineral acids and oxidising agents.

10.2 Chemical stability

Stability	Stable under normal temperature conditions and recommended use.

10.3 Possibility of hazardous reactions

Hazardous reactions	For information on hazardous reactions see section 10.1.
Hazardous polymerisation	Will not polymerise.
Polymerisation description	Not applicable.

10.4 Conditions to Avoid

Conditions to avoid	Heat, sparks, open flames, temperature extremes and direct sunlight.

10.5 Incompatible materials

Materials to avoid Keep away from incompatibles such as oxidizing agents, acids, alkalis. Do not mix with other chemicals unless listed on directions.

10.6 Hazardous decomposition products

Hazardous decomposition products In combustion emits toxic fumes. Decomposition products can include and are not limited to: Oxides of carbon. Unburned hydrocarbons.

Section 11: Toxicological information

11.1 Information on toxicological effects

Toxicological information Harmful in contact with skin. Harmful if inhaled.

Acute toxicity (Oral LD50) No information available as testing has not been completed.
Acute toxicity (Dermal LD50) No information available as testing has not been completed.
Acute toxicity (Inhalation LD50) No information available as testing has not been completed.

Serious eye damage/irritation Causes serious eye irritation.

Skin corrosion/irritation The product is classified as a skin corrosion/irritation hazard.

Respiratory sensitisation The product is not classified as a respiratory hazard.
Skin sensitisation The product is not classified as a skin sensitisation hazard.

Germ cell mutagenicity The product is not classified as a mutagen.

Carcinogenicity The product is not classified as a carcinogen hazard.

Specific target organ toxicity - Single exposure:
STOT - Single exposure The product is classified as a single exposure specific target organ toxin.
Specific target organ toxicity - Repeated exposure:
STOT - Repeated exposure The product is classified as a repeat exposure specific target organ toxin.

Inhalation Harmful if inhaled. May cause respiratory tract irritation. Symptoms may include: Irritation, headache, dizziness, nausea, mental confusion, or unconsciousness.
Ingestion May cause gastrointestinal irritation, nausea, vomiting and diarrhoea. May be fatal if swallowed and enters airways.
Skin contact Harmful in contact with skin. Causes skin irritation.
Eye contact Causes serious eye irritation. May cause redness, swelling, pain and tearing.
Waste management When handling waste, consideration should be made to the safety precautions applying to handling of the product.
Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Since emptied containers contain product residue, follow label warnings even after container is emptied.

Routes of entry Eye and skin contact, ingestion or inhalation.
Target organs Eyes, skin, digestive system, respiratory system.

Aspiration hazards: The product is classified as an aspiration hazard.
Reproductive toxicity: The product is not classified as a reproductive hazard.

Name	LD50 oral	LD50 dermal	LD50 inhalation
Xylene	3523.00mg/kg Rat	12126.00mg/kg Rabbit	27124.00mg/m-3 Rat 4 Hours
ethylbenzene	3500.00mg/kg Rat	15354.00mg/kg Rabbit	17.20mg/l (vapours) Rat 4 Hours
toluene	636.00mg/kg Rat	8390.00mg/kg Rabbit	12.50mg/l (vapours) Rat 4 Hours

Section 12: Ecological information

12.1 Toxicity

Acute toxicity - Fish No information available as testing has not been completed.
Acute toxicity - Aquatic invertebrates No information available as testing has not been completed.
Acute toxicity - Aquatic plants No information available as testing has not been completed.

Acute toxicity - Microorganisms	No information available as testing has not been completed.
Chronic toxicity - Fish	No information available as testing has not been completed.
Chronic toxicity - Aquatic invertebrates	No information available as testing has not been completed.
Chronic toxicity - Aquatic plants	No information available as testing has not been completed.
Chronic toxicity - Microorganisms	No information available as testing has not been completed.
Ecotoxicity	Harmful to aquatic life with long lasting effects.
Eco toxilogical information	No ecological toxicity data available for the overall finished product.

12.2 Persistence and degradability

Degradability	The product is readily biodegradable.
Biological oxygen demand	No information available as testing has not been completed.
Chemical oxygen demand	No information available as testing has not been completed.

12.3 Bioaccumulative potential

Bioaccumulative potential	Low potential for bioaccumulation.
Bioaccumulation factor	No information available as testing has not been completed.
Partition coefficient; n-Octanol/Water	log kow 3,1 - 3,2

12.4 Mobility in soil

Mobility	Readily absorbed in soil. Absorption/desorption: Log Kow < 3.2. The product evaporates readily.

12.5 Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	This product is not identified as a PBT/vPvB substance. Not applicable - UVCB.

12.6 Other adverse effects

Other adverse effects	None known.

Name	Acute toxicity (Fish)	Acute toxicity (Aquatic invertebrates)	Acute toxicity (Aquatic plants)
Xylene	LC50 96 Hours 2.60mg/l Freshwater Fish	EC50 48 Hours 1.00mg/l Daphnia magna	
ethylbenzene	LC50 96 Hours 4.20mg/l Onchorhynchus mykiss (Rainbow Trout)		
toluene	LC50 96 Hours 12.60mg/l Pimephales promelas (Fat-head Minnow)	EC50 48 Hours 11.50mg/l Daphnia magna	

Section 13: Disposal considerations

Waste management	When handling waste, consideration should be made to the safety precautions applying to handling of the product. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Since emptied containers contain product residue, follow label warnings even after container is emptied.

13.1 Waste treatment methods

Disposal methods	Dispose of waste and residues in accordance with local authority requirements, and in accordance with all local, national and international regulations. For waste disposal, use a licensed industrial waste disposal agent.

Section 14: Transport information

14.1 UN number

UN no. (ADR)	UN1307
UN no. (IMDG)	UN1307

UN no. (IATA)	UN1307

14.2 UN proper shipping name

ADR proper shipping name	XYLENES
IMDG proper shipping name	XYLENES
IATA proper shipping name	XYLENES

14.3 Transport hazard class(es)

ADR class	3
IMDG class	3
IATA class	3

Transport labels

14.4 Packing group

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

14.5 Environmental hazards

ADR	No
IMDG	No
IATA	No

14.6 Special precautions for user

EMS	F-E, S-D
Emergency action code	A3
Hazard no. (ADR)	30
Tunnel restriction code	(D/E)

14.7 Transport in bulk according to annex II of MARPOL73/78 and the IBC code

Not applicable.

Section 15: Regulatory information

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

EU legislation	Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 with amendments. The UN Globally Harmonized System (GHS) Safety Data Sheet format (Annex IV) is implemented as Annex II of REACH EU No 830/2015 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
Approved code of practice	2020 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations (2001-2015) and the Safety, Health and Welfare at Work (Carcinogens) Regulations (2001-2019)
Chemical safety assessment	A chemical safety assessment has been carried out.

Section 16: Other information

General information	This Safety Data Sheet is in accordance with REACH Annex II, (EC) No 830/2015. 2020 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations (2001-2015) and the Safety, Health and Welfare at Work (Carcinogens) Regulations (2001-2019)
Revision comments	[1]Information updated. [2]Classification updated. Information updated. [3]Information updated. [4]Information updated. [5]Information updated. [6]Information updated.

	[7]Information updated. [8]Code of practice updated. Information updated. [9]Information updated. [10]Information updated. [11]Information updated. [12]Information updated. [15]Information updated. [16]Information updated.
Revision date	23 September 2020
Supersedes date	27 October 2016
Revision	2
Safety data sheet status	Approved.

Hazard statements in full

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H373	May cause damage to organs through prolonged or repeated exposure .
H412	Harmful to aquatic life with long lasting effects.
H225	Highly flammable liquid and vapour.
H336	May cause drowsiness or dizziness.
H361	Suspected of damaging fertility or the unborn child .

Disclaimer

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use. Since the user's working conditions are not known by us, the information supplied on this safety data sheet is based on our current level of knowledge and on national and community regulations. The mixture must not be used for other uses than those specified in section 1 without having first obtained written handling instructions. It is at all times the responsibility of the user to take all necessary measures to comply with legal requirements and local regulations. The information in this safety data sheet must be regarded as a description of the safety requirements relating to the mixture and not as a guarantee of the properties thereof.

Extended Safety Data Sheet (eSDS)

Substance Name: Xylene
EC Number: 215-535-7
CAS Number: 1330-20-7
REACH Registration Number: 01-2119488216-32-XXXX
Date of Generation/Revision: 23/09/2020

Annex: Exposure Scenarios

Exposure Scenario	Description of use
ES1	Manufacture of substance
ES2	Distribution of substance
ES3	Use as an intermediate
ES4	Formulation & (re)packing of substances and mixtures
ES5	Uses in coatings - Industrial
ES6	Uses in coatings - Professional
ES7	Uses in coatings - Consumer
ES8	Use in cleaning agents - Industrial
ES9	Use in cleaning agents - Professional
ES10	Use in cleaning agents - Consumer
ES11	Lubricants - Industrial
ES12	Lubricants - Professional
ES13	Lubricants - Consumer
ES14	Use as binders and release agents - Industrial
ES15	Use as binders and release agents - Professional
ES16	Use in agrochemicals - Professional
ES17	Use in agrochemicals - Consumer
ES18	Fuels - Industrial
ES19	Fuels - Professional
ES20	Fuels - Consumer
ES21	Polymer production - Industrial
ES22	Polymer processing - Industrial
ES23	Polymer processing - Professional
ES24	Functional fluids - Industrial
ES25	Functional fluids - Professional
ES26	Functional fluids - Consumer

ES27	**Use in oil and gas field drilling and production operations - Industrial**
ES28	**Use in oil and gas field drilling and production operations - Professional**
ES29	**Road and construction applications - Professional**
ES30	**Laboratory use - Industrial**
ES31	**Laboratory use - Industrial**
ES32	**Explosives manufacture & use - Industrial**
ES33	**Manufacture of rubber products - Industrial**
ES34	**Mining chemicals - Industrial**

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Manufacture of substance	SU3		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC15		ERC1, ERC4	
Distribution of substance	SU3, SU8, SU9		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9, PROC15		ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Use as an intermediate	SU3		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC15		ERC1, ERC4	ESVOC SPERC 6.1a.v1
Formulation & (re)packing of substances and mixtures	SU3, SU10		PROC1, PROC2, PROC3, PROC4, PROC5, PROC8A, PROC8B, PROC9, PROC14, PROC15		ERC2	ESVOC SPERC 2.2.v1
Uses in coatings	SU3		PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8A, PROC8B, PROC10, PROC13, PROC15, PROC24		ERC4	ESVOC SPERC 4.3a.v1

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Uses in coatings	SU22		PROC1, PROC2, PROC3, PROC4, PROC5, PROC8A, PROC8B, PROC10, PROC11, PROC13, PROC15, PROC19, PROC24		ERC8a, ERC8c, ERC8d, ERC8f	ESVOC SPERC 8.3b.v1
Uses in coatings	SU21	PC1, PC4, PC8, PC9a, PC9b, PC9c, PC15, PC18, PC23, PC24, PC31, PC34			ERC8a, ERC8c, ERC8d, ERC8f	ESVOC SPERC 8.3c.v1
Use in cleaning agents	SU3, SU10		PROC2, PROC3, PROC4, PROC7, PROC8A, PROC8B, PROC10, PROC13		ERC4	ESVOC SPERC 4.4a.v1
Use in cleaning agents	SU22		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC10, PROC11, PROC13		ERC8a, ERC8c, ERC8d, ERC8f	ESVOC SPERC 8.4b.v1
Use in cleaning agents	SU21	PC3, PC4, PC8, PC9a, PC9b, PC9c, PC24, PC35, PC38			ERC8a, ERC8c, ERC8d, ERC8f	ESVOC SPERC 8.4c.v1

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Lubricants	SU3, SU10		PROC1, PROC2, PROC3, PROC4, PROC7, PROC8A, PROC8B, PROC9, PROC10, PROC13, PROC17		ERC4, ERC7	ESVOC SPERC 4.6a.v1
Lubricants	SU22		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20		ERC8a, ERC8d, ERC9a, ERC9b	ESVOC SPERC 9.6b.v1
Lubricants	SU21	PC1, PC24, PC31			ERC8a, ERC8d, ERC9a, ERC9b	ESVOC SPERC 9.6d.v1
Use as binders and release agents	SU3, SU8, SU9		PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8B, PROC10, PROC13, PROC14		ERC4	ESVOC SPERC 4.10a.v1

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Use as binders and release agents	SU22		PROC1, PROC2, PROC3, PROC4, PROC6, PROC8A, PROC8B, PROC10, PROC11, PROC14		ERC8a, ERC8c, ERC8d, ERC8f	ESVOC SPERC 8.10b.v1
Use in agrochemicals	SU22		PROC1, PROC2, PROC4, PROC8A, PROC8B, PROC11, PROC13		ERC8a, ERC8d	ESVOC SPERC 8.11a.v1
Use in agrochemicals	SU21	PC12, PC27			ERC8a, ERC8d	ESVOC SPERC 8.11b.v1
Fuels	SU3, SU10		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC16		ERC7	ESVOC SPERC 7.12a.v1
Fuels	SU22		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC16		ERC9a, ERC9b	ESVOC SPERC 9.12b.v1
Fuels	SU21	PC13			ERC9a, ERC9b	ESVOC SPERC 9.12c.v1

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Polymer production	SU3, SU10		PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8A, PROC8B, PROC9, PROC14, PROC21		ERC4, ERC6c	ESVOC SPERC 4.21a.v1
Polymer processing	SU3, SU10		PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8A, PROC8B, PROC9, PROC13, PROC14, PROC21		ERC4, ERC6d	ESVOC SPERC 4.21a.v1
Polymer processing	SU22		PROC1, PROC2, PROC8A, PROC8B, PROC14, PROC21		ERC8a, ERC8d	ESVOC SPERC 8.21b.v1
Functional fluids	SU3, SU8, SU9		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9		ERC7	ESVOC SPERC 7.13a.v1
Functional fluids	SU22		PROC1, PROC2, PROC3, PROC8A, PROC9, PROC20		ERC9a, ERC9b	ESVOC SPERC 9.13b.v1
Functional fluids	SU21	PC16, PC17			ERC9a, ERC9b	ESVOC SPERC 9.13c.v1

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Use in oil and gas field drilling and production operations	SU3, SU10		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B		ERC4	ESVOC SPERC 4.5a.v1
Use in oil and gas field drilling and production operations	SU22		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B		ERC8d	ESVOC SPERC 4.5a.v1
Road and construction applications	SU22		PROC7, PROC8A, PROC8B, PROC9, PROC10, PROC11, PROC13		ERC8d, ERC8f	ESVOC SPERC 8.15.v1
Laboratory use	SU3, SU10		PROC10, PROC15		ERC2, ERC4	
Laboratory use	SU22		PROC10, PROC15		ERC8a	ESVOC SPERC 8.17.v1
Explosives manufacture & use	SU3, SU8, SU9		PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC15		ERC2	ESVOC SPERC 2.18.v1
Manufacture of rubber products	SU10		PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8A, PROC8B, PROC13, PROC14, PROC21		ERC1, ERC4, ERC6d	ESVOC SPERC 4.19.v1

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Mining chemicals	SU3, SU8, SU9		PROC1, PROC2, PROC3, PROC4, PROC5, PROC8B, PROC9		ERC4	ESVOC SPERC 4.19.v1

1. Exposure scenario 01

Manufacture of substance

ES Ref: 01 ES Type: Worker	Association ref code: 01

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC15 SU3 ERC1, ERC4
Processes, tasks activities covered	Manufacture of substance or use as an intermediate, process chemical or extracting agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC15)

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 characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	

Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General exposures (closed systems)	Handle substance within a closed system.	
General exposures (closed systems),with sample collection,With occasional controlled exposure.	Handle substance within a closed system.	
General exposures (closed systems),Use in contained batch processes	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
General exposures (open systems),Batch process,with sample collection	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Process sampling	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Laboratory activities	No specific measures identified.	
Bulk transfers,(open systems),With potential for aerosol generation	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out activities involving exposure for more than 1 hour.	
Bulk transfers,(closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out activities involving exposure for more than 1 hour.	
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.	
Storage,With occasional controlled exposure.	Handle substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC1, ERC4)

ERC1	Manufacture of substances
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid
Vapour pressure	5840 Pa
	(25°C)

Operational conditions

Amount used	Annual amount used in the EU	1500000 T
	Regional use tonnage (tons/year):	150000 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	40
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,05
	Release fraction to wastewater from process (initial	0,0001

	release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	0,0001
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 90
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	10000
Conditions and measures related to external treatment of waste for disposal	During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	During manufacturing no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 02

Distribution of substance

ES Ref: 02	Association ref code: 02
ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9, PROC15 SU3, SU8, SU9 ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7 ESVOC SPERC 1.1b.v1
Processes, tasks activities covered	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its distribution and associated laboratory activities Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9, PROC15)

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 characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General exposures (closed systems)	Handle substance within a closed system.	
General exposures (closed systems),with sample collection,With occasional controlled exposure.	Handle substance within a closed system.	
General exposures (closed systems),Use in contained	Handle substance within a closed system.,Provide a	

batch processes	good standard of general ventilation (not less than 3 to 5 air changes per hour).	
General exposures (open systems),Batch process,with sample collection	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Process sampling	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Laboratory activities	No specific measures identified.	
Bulk transfers,(closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out activities involving exposure for more than 1 hour.	
Bulk transfers,(open systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out activities involving exposure for more than 1 hour.	
Drum and small package filling	Transfer via enclosed lines.	
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.	
Storage,With occasional controlled exposure.	Handle substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)

ERC1	Manufacture of substances
ERC2	Formulation of preparations
ERC3	Formulation in materials
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC5	Industrial use resulting in inclusion into or onto a matrix
ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b	Industrial use of reactive processing aids
ERC6c	Industrial use of monomers for manufacture of thermo-plastics
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7	Industrial use of substances in closed systems
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid
Vapour pressure	5840 Pa
	(25°C)

Operational conditions

Amount used	Annual amount used in the EU	1000000 T
	Regional use tonnage (tons/year):	100000 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting	Release fraction to air from process (initial release	0,001

environmental exposure	prior to RMM):	
	Release fraction to wastewater from process (initial release prior to RMM):	0,00001
	Release fraction to soil from process (initial release prior to RMM):	0,00001
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 90
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 03

Use as an intermediate

ES Ref: 03 ES Type: Worker	Association ref code: 03

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC15 SU3 ERC1, ERC4 ESVOC SPERC 6.1a.v1
Processes, tasks activities covered	Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.2 Contributing scenario controlling environmental exposure (ERC1, ERC4, ESVOC SPERC 6.1a.v1)

ERC1	Manufacture of substances
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	150000 T
	Regional use tonnage (tons/year):	15000 T
	Fraction of the main local source	0,25
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,001
	Release fraction to wastewater from process (initial release prior to RMM):	0,00001
	Release fraction to soil from process (initial release prior to RMM):	0,00001
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 80
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage	Estimated substance removal from wastewater via	95,8 %

treatment plant	domestic sewage treatment (%):	
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Not applicable

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 04

Formulation & (re)packing of substances and mixtures

ES Ref: 04 ES Type: Worker	Association ref code: 04

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8A, PROC8B, PROC9, PROC14, PROC15 SU3, SU10 ERC2 ESVOC SPERC 2.2.v1
Processes, tasks activities covered	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, large and small scale packing, maintenance and associated laboratory activities Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC8A, PROC8B, PROC9, PROC14, PROC15)

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 (multistage and/or significant contact)
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General exposures (closed systems)	Handle substance within a closed system.	
General exposures (closed systems),with sample collection,With occasional controlled exposure.	Handle substance within a closed system.	
General exposures (closed systems),Use in contained batch processes	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
General exposures (open systems),Batch process,with sample collection,With potential for aerosol generation	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Batch processes at elevated temperatures	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Process sampling	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Laboratory activities	No specific measures identified.	
Bulk transfers	Ensure material transfers are under containment or extract ventilation.	
Mixing operations (open systems),With potential for aerosol generation	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Manual,Transfer from/pouring from containers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Drum/batch transfers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Production of preparations or articles by tabletting, compression, extrusion, pelletisation	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Drum and small package filling	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.	
Storage,With occasional controlled exposure.	Handle substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC2, ESVOC SPERC 2.2.v1)

ERC2	Formulation of preparations
ESVOC SPERC 2.2.v1	Formulation & packing of preparations and mixtures: Industrial (SU10)
Assessment method	EUSES v2.1

Product characteristics	
Physical form	Medium volatile liquid
Vapour pressure	5840 Pa
	(25°C)

Operational conditions		
Amount used	Annual amount used in the EU	1500000 T
	Regional use tonnage (tons/year):	150000 T
	Fraction of the main local source	0,25
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting	Release fraction to air from process (initial release prior to RMM):	0,025

environmental exposure	Release fraction to wastewater from process (initial release prior to RMM):	0,002
	Release fraction to soil from process (initial release prior to RMM):	0,0001
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements):	
	Treat air emission to provide a typical removal efficiency of (%):	0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent level.

1. Exposure scenario 05

Uses in coatings

ES Ref: 05 ES Type: Worker	Association ref code: 05

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8A, PROC8B, PROC10, PROC13, PROC15, PROC24 SU3 ERC4 ESVOC SPERC 4.3a.v1
Processes, tasks activities covered	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8A, PROC8B, PROC10, PROC13, PROC15, PROC24)

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 (multistage and/or significant contact)
PROC7	Industrial spraying
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring
PROC15	Use as laboratory reagent
PROC24	High (mechanical) energy work-up of substances bound in materials and/or articles

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers	Assumes use at not more than 20°C above ambient temperature.	

exposure	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General exposures (closed systems)	Handle substance within a closed system.	
General exposures (closed systems),with sample collection,Use in contained systems	Handle substance within a closed system.	
Film formation - force drying (50-100°C). stoving (>100°C). UV/EB radiation curing	Handle substance within a closed system.	
Mixing operations (closed systems),General exposures (closed systems)	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Film formation - air drying	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Preparation of material for application,Mixing operations (open systems)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Spraying (automatic/robotic)	Carry out in a vented booth provided with laminar airflow.	
Manual,Spraying	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Wear a respirator conforming to EN140 with Type A filter or better.	
Material transfers,Non-dedicated facility	Ensure material transfers are under containment or extract ventilation.	
Material transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation.	
Roller, spreader, flow application	Provide extract ventilation to points where emissions occur.	
Dipping, immersion and pouring	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Laboratory activities	No specific measures identified.	
Material transfers,Drum/batch transfers,Transfer from/pouring from containers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Production of preparations or articles by tabletting, compression, extrusion, pelletisation	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.	
Storage,With occasional controlled exposure.	Handle substance within a closed system.	
Mechanical cutting, grinding, drilling or sanding.	No specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.3a.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ESVOC SPERC 4.3a.v1	Uses in coatings: Industrial (SU3)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid
Vapour pressure	5840 Pa
	(25°C)

Operational conditions

Amount used	Annual amount used in the EU	50000 T

	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	0,5
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,98
	Release fraction to wastewater from process (initial release prior to RMM):	0,007
	Release fraction to soil from process (initial release prior to RMM):	0
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 90
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Soil emission controls are not applicable as there is no direct release to soil.	
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 06

Uses in coatings

ES Ref: 06 ES Type: Worker	Association ref code: 06

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8A, PROC8B, PROC10, PROC11, PROC13, PROC15, PROC19, PROC24 SU22 ERC8a, ERC8c, ERC8d, ERC8f ESVOC SPERC 8.3b.v1
Processes, tasks activities covered	Covers the use in coatings (paints, inks, adhesives, etc) within closed or contained systems including incidental exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application activities and film formation) and equipment cleaning, maintenance and associated laboratory activities. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC8A, PROC8B, PROC10, PROC11, PROC13, PROC15, PROC19, PROC24)

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 (multistage and/or significant contact)
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC15	Use as laboratory reagent
PROC19	Hand-mixing with intimate contact and only PPE available
PROC24	High (mechanical) energy work-up of substances bound in materials and/or articles

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers	Assumes use at not more than 20°C above ambient	

exposure	temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General exposures (closed systems)	Handle substance within a closed system.	
Filling / preparation of equipment from drums or containers	Handle substance within a closed system.,Ensure material transfers are under containment or extract ventilation.	
General exposures (closed systems),Use in contained systems	Handle substance within a closed system.,Ensure material transfers are under containment or extract ventilation.	
Preparation of material for application	Handle substance within a closed system.,Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Film formation - air drying,Outdoor	Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.,Wear suitable gloves tested to EN374.	
Film formation - air drying,Indoor.	Provide extract ventilation to points where emissions occur.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Preparation of material for application,Indoor.	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Preparation of material for application,Outdoor.	Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	
Material transfers,Drum/batch transfers	Transfer via enclosed lines.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Roller, spreader, flow application,indoor	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Wear a respirator conforming to EN140 with Type A filter or better.	
Roller, spreader, flow application,Outdoor	Ensure operation is undertaken outdoors.,Wear a respirator conforming to EN140 with Type A filter or better.	
Manual,Spraying,indoor	Carry out in a vented booth provided with laminar airflow.	
Manual,Spraying,Outdoor	Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 4 hours.,Wear suitable gloves tested to EN374.,Wear a respirator conforming to EN140 with Type A filter or better.	
Dipping, immersion and pouring,indoor	Provide extract ventilation to points where emissions occur.,Avoid carrying out operation for more than 4 hours.	
Dipping, immersion and pouring,Outdoor	Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 4 hours.,Wear suitable gloves tested to EN374.,Wear a respirator conforming to EN140 with Type A filter or better.	
Laboratory activities	Handle in a fume cupboard or under extract ventilation.	
Hand application - finger paints, pastels, adhesives,indoor	Limit the substance content in the product to 5 %.,Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Wear suitable gloves tested to EN374.	
Hand application - finger paints, pastels, adhesives,Outdoor	Limit the substance content in the mixture to 5 %.,Ensure operation is undertaken outdoors.,Avoid	

	carrying out operation for more than 4 hours.,Wear suitable gloves tested to EN374.	
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.,Avoid carrying out operation for more than 4 hours.	
Storage,With occasional controlled exposure.	Handle substance within a closed system.,Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Mechanical cutting, grinding, drilling or sanding.	No specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8c, ERC8d, ERC8f, ESVOC SPERC 8.3b.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8c	Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ERC8f	Wide dispersive outdoor use resulting in inclusion into or onto a matrix
ESVOC SPERC 8.3b.v1	Uses in coatings: Professional (SU22)
Assessment method	EUSES v2.1

Product characteristics	
Physical form	Medium volatile liquid
Vapour pressure	5840 Pa
	(25°C)

Operational conditions		
Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,98
	Release fraction to wastewater from process (initial release prior to RMM):	0,01
	Release fraction to soil from process (initial release prior to RMM):	0,01

Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
Organizational measures to prevent/limit release from the site	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery	External recovery and recycling of waste should	

of waste	comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 07

Uses in coatings

ES Ref: 07 ES Type: Consumer	Association ref code: 07

Use descriptors	PC1, PC4, PC8, PC9a, PC9b, PC9c, PC15, PC18, PC23, PC24, PC31, PC34 SU21 ERC8a, ERC8c, ERC8d, ERC8f ESVOC SPERC 8.3c.v1
Processes, tasks activities covered	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning. Consumer use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC1, PC4, PC8, PC9a, PC9b, PC9c, PC15, PC18, PC23, PC24, PC31, PC34)

PC1	Adhesives, sealants
PC4	Anti-Freeze and De-icing products
PC8	Biocidal products (e.g. Disinfectants, pest control)
PC9a	Coatings and paints, thinners, paint removers
PC9b	Fillers, putties, plasters, modelling clay
PC9c	Finger paints
PC15	Non-metal-surface treatment products
PC18	Ink and Toners
PC23	Leather tanning, dye, finishing, impregnation and care products
PC24	Lubricants, Greases and Release Products
PC31	Polishes and Wax Blends
PC34	Textile dyes, finishing and impregnating products; including bleaches and other processing aids

Product characteristics

Physical form	liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	950 Pa

Operational conditions

Amount used	For each use event, covers use amounts up to: 6900 g,Unless otherwise stated.	
	Covers skin contact area up to 857.5 cm^2,Unless otherwise stated.	
Frequency and duration of use	Uses per day : 1,Unless otherwise stated.	
	Covers exposure up to,6 Hours/event,Unless otherwise stated.	
Other given operational conditions affecting consumers exposure	Assumes activities are at ambient temperature (unless stated differently).	
	Covers use in room size of 20 m^3,Unless otherwise	

	stated.	
	Covers use under typical household ventilation.	
	Adhesives, sealants,Glues, hobby use	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35.73 cm^2. For each use event, covers use amounts up to: 9 g. Covers use in room size of 20 m^3. Covers exposure up to 4. Hours/event
	Adhesives, sealants,Glues DIY-use (carpet glue, tile glue, wood parquet glue)	Unless otherwise stated. Covers concentrations up to 0.2%. Covers use up to 1. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35.70 cm^2. For each use event, covers use amounts up to: 6390 g. Covers use in room size of 20 m^3. Covers exposure up to 6,00. Hours/event
	Adhesives, sealants,Glue from spray	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm^2. For each use event, covers use amounts up to: 85.05 g. Covers use in room size of 20 m^3. Covers exposure up to 4,00. Hours/event
	Adhesives, sealants,Sealants	Unless otherwise stated. Covers concentrations up to 25%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm^2. For each use event, covers use amounts up to: 75g. Covers use in room size of 20 m^3. Covers exposure up to 1,00. Hours/event
	Anti-freeze and de-icing products,Washing car window	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0.5 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34

		m³. Covers exposure up to 0,02. Hours/event
	Anti-freeze and de-icing products,Pouring into radiator	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm². For each use event, covers use amounts up to: 2000 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,17. Hours/event
	Anti-freeze and de-icing products,Lock de-icer	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214,40 cm². For each use event, covers use amounts up to: 4 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,25. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Laundry and dish washing products	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857.5 cm². For each use event, covers use amounts up to: 15 g. Covers use in room size of 20 m³. Covers exposure up to 0.50. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm². For each use event, covers use amounts up to: 27 g. Covers use in room size of 20 m³. Covers exposure up to 0,33. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated. Covers concentrations up to 15%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428

		cm². For each use event, covers use amounts up to: 35 g. Covers use in room size of 20 m³. Covers exposure up to 0,17. Hours/event
	Coatings and paints, thinners, paint removers,Waterborne latex wall paint	Unless otherwise stated. Covers concentrations up to 0.5%. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm². For each use event, covers use amounts up to: 2760 g. Covers use in room size of 20 m³. Covers exposure up to 2,20. Hours/event
	Coatings and paints, thinners, paint removers,Solvent rich, high solid, water borne paint	Unless otherwise stated. Covers concentrations up to 2%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm². For each use event, covers use amounts up to: 744 g. Covers use in room size of 20 m³. Covers exposure up to 2,20. Hours/event
	Coatings and paints, thinners, paint removers,Aerosol spray can	Unless otherwise stated. Covers concentrations up to 21%. Covers use up to 2. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 215 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,33. Hours/event
	Coatings and paints, thinners, paint removers,Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated. Covers concentrations up to 3%. Covers use up to 3. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm². For each use event, covers use amounts up to: 491 g. Covers use in room size of 20 m³. Covers exposure up to 2,00. Hours/event
	Fillers, putties, plasters, modelling clay,Fillers and putty	Unless otherwise stated. Covers concentrations up to 2%. Covers use up to 12. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm². For each use event,

		covers use amounts up to: 85 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event
	Fillers, putties, plasters, modelling clay,Plasters and floor equalizers	Unless otherwise stated. Covers concentrations up to 0.3%. Covers use up to 2. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^2. For each use event, covers use amounts up to: 6900 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 0.5. Hours/event
	Fillers, putties, plasters, modelling clay,Modelling clay	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 254,40 cm^2. For each use event, assumes swallowed amount of .... 1g. Covers use in room size of 20 m^3. Covers exposure up to 1. Hours/event
	Finger paints,Finger paints	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 254,40 cm^2. For each use event, assumes swallowed amount of .... 1.35 g. Covers use in room size of 20 m^3. Covers exposure up to 0.03. Hours/event
	Non-metal-surface treatment products,Waterborne latex wall paint	Unless otherwise stated. Covers concentrations up to 0.5%. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm^2. For each use event, covers use amounts up to: 2760 g. Covers use in room size of 20 m^3. Covers exposure up to 2,20. Hours/event
	Non-metal-surface treatment products,Solvent rich, high solid, water borne paint	Unless otherwise stated. Covers concentrations up to 2.2%. Covers use up to 6. days/year. covers use up to 1

		days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,33. Hours/event
	Textile dyes, finishing and impregnating products; including bleaches and other processing aids	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm². For each use event, covers use amounts up to: 115 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 1,00. Hours/event

Risk management measures

Other risk management measures:

Adhesives, sealants,Glues DIY-use (carpet glue, tile glue, wood parquet glue)	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, sealants,Glue from spray	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, sealants,Sealants	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Washing car window	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Pouring into radiator	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Lock de-icer	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Laundry and dish washing products	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, thinners, paint removers,Waterborne latex wall paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, thinners, paint removers,Solvent rich, high solid, water borne paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, thinners, paint removers,Aerosol spray can	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, thinners, paint removers,Removers (paint-, glue-, wall paper-,	No specific risk management measure identified beyond those operational conditions stated.	

sealant-remover)		
Fillers, putties, plasters, modelling clay,Fillers and putty	No specific risk management measure identified beyond those operational conditions stated.	
Fillers, putties, plasters, modelling clay,Plasters and floor equalizers	No specific risk management measure identified beyond those operational conditions stated.	
Fillers, putties, plasters, modelling clay	No specific risk management measure identified beyond those operational conditions stated.	
Finger paints,Finger paints	No specific risk management measure identified beyond those operational conditions stated.	
Non-metal-surface treatment products,Waterborne latex wall paint	No specific risk management measure identified beyond those operational conditions stated.	
Non-metal-surface treatment products,Solvent rich, high solid, water borne paint	No specific risk management measure identified beyond those operational conditions stated.	
Non-metal-surface treatment products,Aerosol spray can	No specific risk management measure identified beyond those operational conditions stated.	
Non-metal-surface treatment products,Removers (paint-, glue-, wall paper-, sealant-remover)	No specific risk management measure identified beyond those operational conditions stated.	
Ink and toners,Ink and toners	No specific risk management measure identified beyond those operational conditions stated.	
Leather tanning, dye, finishing, impregnation and care products,Polishes, wax / cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Leather tanning, dye, finishing, impregnation and care products,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified beyond those operational conditions stated.	
Polishes and wax blends,Polishes, wax / cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Polishes and wax blends,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Textile dyes, finishing and impregnating products; including bleaches and other processing aids	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, sealants,Glues, hobby use	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8c, ERC8d, ERC8f, ESVOC SPERC 8.3c.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8c	Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ERC8f	Wide dispersive outdoor use resulting in inclusion into or onto a matrix
ESVOC SPERC 8.3c.v1	Uses in coatings: Consumer (SU21)
Assessment method	EUSES v2.1

Product characteristics	
Physical form	Medium volatile liquid
Vapour pressure	5840 Pa

	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	50000 t/yr
	Regional use tonnage (tons/year):	5000
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year): 365	
Environmental factors not influenced by risk management	Local freshwater dilution factor: 10	
	Local marine water dilution factor: 100	
Other given operational conditions affecting environmental exposure	Treat air emission to provide a typical removal efficiency of (%): 0	
	Typical onsite wastewater treatment technology provides removal efficiency of (%): 98.8%	
	Prevent environmental discharge consistent with regulatory requirements.	
	Release fraction to air from wide dispersive use (regional only): 0.985	
	Release fraction to wastewater from wide dispersive use: 0.01	
	Release fraction to soil from wide dispersive use (regional only): 0.005	
Risk management measures		
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA, Consumer

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 08

Use in cleaning agents

ES Ref: 08 ES Type: Worker	Association ref code: 08

Use descriptors	PROC2, PROC3, PROC4, PROC7, PROC8A, PROC8B, PROC10, PROC13 SU3, SU10 ERC4 ESVOC SPERC 4.4a.v1
Processes, tasks activities covered	Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC2, PROC3, PROC4, PROC7, PROC8A, PROC8B, PROC10, PROC13)

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 characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Bulk transfers	Ensure material transfers are under containment or extract ventilation.	
Automated process with (semi) closed systems,Use in contained systems	Handle substance within a closed system.	

Automated process with (semi) closed systems,Drum/batch transfers,Use in contained systems	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Application of cleaning products in closed systems	Handle substance within a closed system.	
Filling / preparation of equipment from drums or containers,Dedicated facility	Provide extract ventilation to points where emissions occur.	
Use in contained batch processes,Treatment by heating	Provide extract ventilation to points where emissions occur.	
Degreasing small objects in cleaning station	Provide extract ventilation to points where emissions occur.	
Cleaning with low-pressure washers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Cleaning with high pressure washers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Avoid carrying out operation for more than 1 hour.,Wear suitable gloves tested to EN374.	
Manual,Surfaces,Cleaning,no spraying	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.	
Storage,With occasional controlled exposure.	Handle substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.4a.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ESVOC SPERC 4.4a.v1	Use in cleaning agents: Industrial (SU3)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	1
	Release fraction to wastewater from process (initial release prior to RMM):	0,00003
	Release fraction to soil from process (initial release prior to RMM):	0
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 70
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8

	Soil emission controls are not applicable as there is no direct release to soil.	
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 09

Use in cleaning agents

ES Ref: 09 ES Type: Worker	Association ref code: 08

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC10, PROC11, PROC13 SU22 ERC8a, ERC8c, ERC8d, ERC8f ESVOC SPERC 8.4b.v1
Processes, tasks activities covered	Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC10, PROC11, PROC13)

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 characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Filling / preparation of equipment from drums or	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	

containers,Dedicated facility		
Automated process with (semi) closed systems,Use in contained systems	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Automated process with (semi) closed systems,Use in contained systems,Drum/batch transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Filling / preparation of equipment from drums or containers,Outdoor.	Use drum pumps or carefully pour from container.,Ensure operation is undertaken outdoors.	
Manual,Surfaces,Cleaning,Dipping, immersion and pouring	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Wear a respirator conforming to EN140 with Type A filter or better.	
Cleaning with low-pressure washers,Rolling, Brushing,no spraying	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Wear a respirator conforming to EN140 with Type A filter or better.	
Cleaning with high pressure washers,Spraying,Indoor.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Wear a respirator conforming to EN140 with Type A filter or better.	
Cleaning with high pressure washers,Spraying,Outdoor.	Limit the substance content in the mixture to 5 %.,Ensure operation is undertaken outdoors.,Wear a respirator conforming to EN140 with Type A filter or better.	
Manual,Surfaces,Cleaning,Spraying	Provide extract ventilation to points where emissions occur.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Ad hoc manual application via trigger sprays, dipping, etc,Rolling, Brushing	Provide extract ventilation to points where emissions occur.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Ad hoc manual application via trigger sprays, dipping, etc,Rolling, Brushing	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Application of cleaning products in closed systems,Outdoor	Handle substance within a closed system.,Ensure operation is undertaken outdoors.	
Cleaning of medical devices	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.,Avoid carrying out activities involving exposure for more than 4 hours.	
Storage,With occasional controlled exposure.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8c, ERC8d, ERC8f, ESVOC SPERC 8.4b.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8c	Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ERC8f	Wide dispersive outdoor use resulting in inclusion into or onto a matrix
ESVOC SPERC 8.4b.v1	Use in cleaning agents: Professional (SU22)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,02
	Release fraction to wastewater from process (initial release prior to RMM):	0,000001
	Release fraction to soil from process (initial release prior to RMM):	0
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Soil emission controls are not applicable as there is no direct release to soil.	
Organizational measures to prevent/limit release from the site	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	20000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health	
Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 10

Use in cleaning agents

ES Ref: 10 ES Type: Consumer	Association ref code: 10

Use descriptors	PC3, PC4, PC8, PC9a, PC9b, PC9c, PC24, PC35, PC38 SU21 ERC8a, ERC8c, ERC8d, ERC8f ESVOC SPERC 8.4c.v1
Processes, tasks activities covered	Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products. Consumer use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC3, PC4, PC8, PC9a, PC9b, PC9c, PC24, PC35, PC38)

PC3	Air care products
PC4	Anti-Freeze and De-icing products
PC8	Biocidal products (e.g. Disinfectants, pest control)
PC9a	Coatings and paints, thinners, paint removers
PC9b	Fillers, putties, plasters, modelling clay
PC9c	Finger paints
PC24	Lubricants, Greases and Release Products
PC35	Washing and cleaning products (including solvent based products)
PC38	Welding and soldering products, flux products

Product characteristics

Physical form	liquid
Concentration of the Substance in Mixture/Article	Limit the substance content in the product to 50 %.
Vapour pressure	950 Pa

Operational conditions

Amount used	For each use event, covers use amounts up to: 6900 g,Unless otherwise stated.	
	Covers skin contact area up to 857.5 cm^2,Unless otherwise stated.	
Frequency and duration of use	Uses per day : 4,Unless otherwise stated.	
	Covers exposure up to,8 Hours/event,Unless otherwise stated.	
Other given operational conditions affecting consumers exposure	Air care products,Air care, instant action (aerosol sprays)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. Uses per day : 4. For each use event, covers use amounts up to: 0,1 g. Covers use in room size of 20 m^3. Covers exposure up to

		0,25. Hours/event
	Air care products,Air care, continuous action (solid and liquid)	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,70 cm^2. For each use event, covers use amounts up to: 0,48 g . Covers use in room size of 20 m^3. Covers exposure up to 8,00. Hours/event
	Anti-freeze and de-icing products,Washing car window	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0,5 g . Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m^3. Covers exposure up to 0,02. Hours/event
	Anti-freeze and de-icing products,Pouring into radiator	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm^2. For each use event, covers use amounts up to: 2000 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m^3. Covers exposure up to 0.17. Hours/event
	Anti-freeze and de-icing products,Lock de-icer	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214.40 cm^2. For each use event, covers use amounts up to: 4 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m^3. Covers exposure up to 0.25. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Laundry and dish washing products	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers

		skin contact area up to 857.50 cm². For each use event, covers use amounts up to: 15 g. Covers use in room size of 20 m³. Covers exposure up to 0.50. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm². For each use event, covers use amounts up to: 27 g . Covers use in room size of 20 m³. Covers exposure up to 0,33. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated. Covers concentrations up to 17%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm². For each use event, covers use amounts up to: 35 g. Covers use in room size of 20 m³. Covers exposure up to 0.17. Hours/event
	Coatings and paints, thinners, paint removers,Waterborne latex wall paint	Unless otherwise stated. Covers concentrations up to 0.2%. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428.75 cm². For each use event, covers use amounts up to: 2760 g. Covers use in room size of 20 m³. Covers exposure up to 2.20. Hours/event
	Coatings and paints, thinners, paint removers,Solvent rich, high solid, water borne paint	Unless otherwise stated. Covers concentrations up to 2.3%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm². For each use event, covers use amounts up to: 744 g . Covers use in room size of 20 m³. Covers exposure up to 2,20. Hours/event
	Coatings and paints, thinners, paint removers,Aerosol spray can	Unless otherwise stated. Covers concentrations up to 5.5%. Covers use up to 2. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 215 g. Covers

		use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0.33. Hours/event
	Coatings and paints, thinners, paint removers,Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated. Covers concentrations up to 3%. Covers use up to 3. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm². For each use event, covers use amounts up to: 491 g. Covers use in room size of 20 m³. Covers exposure up to 2,00. Hours/event
	Fillers, putties, plasters, modelling clay,Fillers and putty	Unless otherwise stated. Covers concentrations up to 2%. Covers use up to 12. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm². For each use event, covers use amounts up to: 85 g. Covers use in room size of 20 m³. Covers exposure up to 4,00. Hours/event
	Fillers, putties, plasters, modelling clay,Plasters and floor equalizers	Unless otherwise stated. Covers concentrations up to 0.2%. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm². For each use event, covers use amounts up to: 6900 g. Covers use in room size of 20 m³. Covers exposure up to 1. Hours/event
	Fillers, putties, plasters, modelling clay,Modelling clay	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 254,40 cm². For each use event, assumes swallowed amount of .... 1 g. Covers use in room size of 20 m³
	Finger paints	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 254.40 cm². For each use event, assumes swallowed amount of .... 1.35 g. Covers use in room size of 20 m³

	Lubricants, greases, release products,Liquids	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468.00 cm^2. For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage ($34m^3$) under typical ventilation. Covers use in room size of 34 m^3. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Pastes	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 10. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468.00 cm^2. For each use event, covers use amounts up to: 34 g. Covers use in a one car garage ($34m^3$) under typical ventilation. Covers use in room size of 34 m^3
	Lubricants, greases, release products,Sprays	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm^2. For each use event, covers use amounts up to: 73 g . Covers use in room size of 20 m^3. Covers exposure up to 0,17. Hours/event
	Washing and cleaning products (including solvent based products),Laundry and dish washing products	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^2. For each use event, covers use amounts up to: 15 g . Covers use in room size of 20 m^3. Covers exposure up to 0,50. Hours/event
	Washing and cleaning products (including solvent based products),Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^2. For each use event, covers use amounts up to: 27 g . Covers use in room size of 20 m^3. Covers exposure up to

		0,33. Hours/event
	Washing and cleaning products (including solvent based products),Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated. Covers concentrations up to 17%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428.00 cm^2. For each use event, covers use amounts up to: 35 g. Covers use in room size of 20 m^3. Covers exposure up to 0,17. Hours/event
	Welding and soldering products (with flux coatings or flux cores), flux products	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 12 g. Covers use in room size of 20 m^3. Covers exposure up to 1,00. Hours/event

Risk management measures

Other risk management measures:

Air care products,Air care, instant action (aerosol sprays)	No specific risk management measure identified beyond those operational conditions stated.	
Air care products,Air care, continuous action (solid and liquid)	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Washing car window	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Pouring into radiator	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Lock de-icer	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Laundry and dish washing products	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, thinners, paint removers,Waterborne latex wall paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, thinners, paint removers,Solvent rich, high solid, water borne paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, thinners, paint removers,Aerosol spray can	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, thinners, paint removers,Removers (paint-, glue-, wall paper-, sealant-remover)	No specific risk management measure identified beyond those operational conditions stated.	
Fillers, putties, plasters, modelling clay,Fillers and	No specific risk management measure identified beyond those operational conditions stated.	

putty		
Fillers, putties, plasters, modelling clay,Plasters and floor equalizers	No specific risk management measure identified beyond those operational conditions stated.	
Fillers, putties, plasters, modelling clay	No specific risk management measure identified beyond those operational conditions stated.	
Finger paints,Finger paints	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified beyond those operational conditions stated.	
Washing and cleaning products (including solvent based products),Laundry and dish washing products	No specific risk management measure identified beyond those operational conditions stated.	
Washing and cleaning products (including solvent based products),Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Washing and cleaning products (including solvent based products),Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Welding and soldering products (with flux coatings or flux cores), flux products	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8c, ERC8d, ERC8f, ESVOC SPERC 8.4c.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8c	Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ERC8f	Wide dispersive outdoor use resulting in inclusion into or onto a matrix
ESVOC SPERC 8.4c.v1	Use in cleaning agents: Consumer (SU21)
Assessment method	EUSES v2.1

Product characteristics	
Physical form	Medium volatile liquid
Vapour pressure	5840 Pa

Operational conditions		
Amount used	Annual amount used in the EU	50000 t/yr
	Regional use tonnage (tons/year):	5000
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year): 365	
Environmental factors not influenced by risk management	Local freshwater dilution factor: 10	
	Local marine water dilution factor: 100	
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	0,95
	Release fraction to wastewater from wide dispersive use:	0,025
	Release fraction to soil from wide dispersive use (regional only):	0,025

	Treat air emission to provide a typical removal efficiency of (%): 0	
	Typical onsite wastewater treatment technology provides removal efficiency of (%): 95.8	
	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Risk management measures		
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA, Consumer

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 11

Lubricants

ES Ref: 11	Association ref code: 11
ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC7, PROC8A, PROC8B, PROC9, PROC10, PROC13, PROC17 SU3, SU10 ERC4, ERC7 ESVOC SPERC 4.6a.v1
Processes, tasks activities covered	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC7, PROC8A, PROC8B, PROC9, PROC10, PROC13, PROC17)

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
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions and in partly open process

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General exposures (closed systems)	Handle substance within a closed system.	
General exposures (closed systems),With occasional controlled exposure.	Handle substance within a closed system.	
General exposures (closed systems),Batch process	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
General exposures (open systems),With occasional controlled exposure.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
General exposures (open systems),Batch process	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Bulk transfers,Dedicated facility	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Filling / preparation of equipment from drums or containers,Non-dedicated facility	Use drum pumps or carefully pour from container.	
Filling / preparation of equipment from drums or containers,Dedicated facility	Use drum pumps or carefully pour from container.,Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Initial factory fill of equipment	Ensure material transfers are under containment or extract ventilation.	
Operation and lubrication of high energy open equipment,indoor	Restrict area of openings to equipment.,Provide extract ventilation to points where emissions occur.	
Operation and lubrication of high energy open equipment	Restrict area of openings to equipment.,Provide extract ventilation to points where emissions occur.	
Manual,Rolling, Brushing	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Treatment by dipping and pouring	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	
Maintenance (of larger plant items) and machine set up	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Maintenance (of larger plant items) and machine set up	Ensure material transfers are under containment or extract ventilation.	
Maintenance of small items	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Remanufacture of reject articles	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Storage	Store substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC7, ESVOC SPERC 4.6a.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC7	Industrial use of substances in closed systems
ESVOC SPERC 4.6a.v1	Lubricants: Industrial (SU3)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid
Vapour pressure	5840 Pa
	(25°C)

Operational conditions		
Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,01
	Release fraction to wastewater from process (initial release prior to RMM):	0,0003
	Release fraction to soil from process (initial release prior to RMM):	0,001
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 70
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 12

Lubricants

ES Ref: 12 ES Type: Worker	Association ref code: 12

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20 SU22 ERC8a, ERC8d, ERC9a, ERC9b ESVOC SPERC 9.6b.v1
Processes, tasks activities covered	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions and in partly open process
PROC18	Greasing at high energy conditions
PROC20	Heat and pressure transfer fluids in dispersive use but closed systems

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational	

	hygiene is implemented.	

Risk management measures

Other risk management measures:

General exposures (closed systems)	Handle substance within a closed system.	
General exposures (closed systems),Batch process	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
General exposures (closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
General exposures (open systems)	Ensure material transfers are under containment or extract ventilation.	
Bulk transfers,Dedicated facility	Transfer via enclosed lines.	
Filling / preparation of equipment from drums or containers,Dedicated facility	Transfer via enclosed lines.	
Filling / preparation of equipment from drums or containers,Non-dedicated facility	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Use drum pumps or carefully pour from container.	
Operation and lubrication of high energy open equipment	Restrict area of openings to equipment.,Provide extract ventilation to points where emissions occur.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Operation and lubrication of high energy open equipment,Outdoor	Limit the substance content in the mixture to 5 %.,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 4 hours.	
Operation and lubrication of high energy open equipment	Limit the substance content in the mixture to 5 %.,Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Maintenance (of larger plant items) and machine set up,Dedicated facility	Ensure material transfers are under containment or extract ventilation.	
Maintenance (of larger plant items) and machine set up,Elevated temperature	Provide extract ventilation to emission points when contact with warm (>50oC) product is likely.,Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Maintenance of small items	Drain down and flush system prior to equipment break-in or maintenance.,Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Avoid carrying out operation for more than 4 hours.	
Engine lubricant service	Transfer via enclosed lines.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Wear suitable gloves tested to EN374.	
Batch process,With occasional controlled exposure.	Store substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ERC9a, ERC9b, ESVOC SPERC 9.6b.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
ESVOC SPERC 9.6b.v1	Lubricants: Professional (SU22) - low environmental release
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,01
	Release fraction to wastewater from process (initial release prior to RMM):	0,01
	Release fraction to soil from process (initial release prior to RMM):	0,01
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
Organizational measures to prevent/limit release from the site	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 13

Lubricants

ES Ref: 13 ES Type: Consumer	Association ref code: 13

Use descriptors	PC1, PC24, PC31 SU21 ERC8a, ERC8d, ERC9a, ERC9b ESVOC SPERC 9.6d.v1
Processes, tasks activities covered	Covers the consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment maintenance and disposal of waste oil. Consumer use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC1, PC24, PC31)

PC1	Adhesives, sealants
PC24	Lubricants, Greases and Release Products
PC31	Polishes and Wax Blends

Product characteristics

Physical form	liquid
Concentration of the Substance in Mixture/Article	Limit the substance content in the product to 50 %.
Vapour pressure	950 Pa

Operational conditions

Amount used	For each use event, covers use amounts up to: 3195 g,Unless otherwise stated.	
	Covers skin contact area up to 468 cm^2,Unless otherwise stated.	
Frequency and duration of use	Uses per day : 1,Unless otherwise stated.	
	Covers exposure up to,6 Hours/event,Unless otherwise stated.	
Other given operational conditions affecting consumers exposure	Assumes activities are at ambient temperature (unless stated differently).	
	Covers use in room size of 20 m^3,Unless otherwise stated.	
	Covers use under typical household ventilation.	
	Adhesives, sealants,Glues, hobby use	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35.73 cm^2. For each use event, covers use amounts up to: 9 g. Covers use in room size of 20 m^3. Covers exposure up to 4.

		Hours/event
	Adhesives, sealants,Glues DIY-use (carpet glue, tile glue, wood parquet glue)	Unless otherwise stated. Covers concentrations up to 0.1%. Covers use up to 1. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 110 cm^2. For each use event, covers use amounts up to: 3195 g. Covers use in room size of 20 m^3. Covers exposure up to 6,00. Hours/event
	Adhesives, sealants,Glue from spray	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm^2. For each use event, covers use amounts up to: 85.05 g. Covers use in room size of 20 m^3. Covers exposure up to 4,00. Hours/event
	Adhesives, sealants,Sealants	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm^2. For each use event, covers use amounts up to: 75g. Covers use in room size of 20 m^3. Covers exposure up to 1,00. Hours/event
	Lubricants, greases, release products,Liquids	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm^2. For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m^3. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Pastes	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 10. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm^2. For each use event, covers use amounts up to: 34

		g. Covers use in room size of 20 m³
	Lubricants, greases, release products,Sprays	Unless otherwise stated. Covers concentrations up to 8%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm². For each use event, covers use amounts up to: 73 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,17. Hours/event
	Polishes and wax blends,Polishes, wax / cream (floor, furniture, shoes)	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 29. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 142 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 1.23. Hours/event
	Polishes and wax blends,Polishes, spray (furniture, shoes)	Unless otherwise stated. Covers concentrations up to 18%. Covers use up to 8. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,33. Hours/event

Risk management measures

Other risk management measures:

Adhesives, sealants,Glues, hobby use	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, sealants,Glues DIY-use (carpet glue, tile glue, wood parquet glue)	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, sealants,Glue from spray	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, sealants,Sealants	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified	

	beyond those operational conditions stated.	
Polishes and wax blends,Polishes, wax / cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Polishes and wax blends,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ERC9a, ERC9b, ESVOC SPERC 9.6d.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
ESVOC SPERC 9.6d.v1	Lubricants: Consumer (SU21) - low environmental release
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	50000 t/yr
	Regional use tonnage (tons/year):	5000
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year): 365	
Environmental factors not influenced by risk management	Local freshwater dilution factor: 10	
	Local marine water dilution factor: 100	
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only): 0.01	
	Release fraction to wastewater from wide dispersive use: 0.01	
	Release fraction to soil from wide dispersive use (regional only): 0.01	
	Treat air emission to provide a typical removal efficiency of (%): 0	
	Typical onsite wastewater treatment technology provides removal efficiency of (%): 95.8	
	Prevent environmental discharge consistent with regulatory requirements.	
Risk management measures		
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA, Consumer

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 14

Use as binders and release agents

ES Ref: 14 ES Type: Worker	Association ref code: 14

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8B, PROC10, PROC13, PROC14 SU3, SU8, SU9 ERC4 ESVOC SPERC 4.10a.v1
Processes, tasks activities covered	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing) and handling of waste. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8B, PROC10, PROC13, PROC14)

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
PROC6	Calendering operations
PROC7	Industrial spraying
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
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Material transfers	Handle substance within a closed system.	
Material transfers,With occasional controlled exposure.	Handle substance within a closed system.	

Material transfers,Batch process,(closed systems)	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Drum/batch transfers	Transfer via enclosed lines.	
Mixing operations (closed systems)	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Mixing operations (open systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Mold forming	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Casting operations	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	
Spraying,Machine	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	
Roller application or brushing,Manual	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Spraying,Manual	Carry out in a vented booth or extracted enclosure.,Avoid carrying out operation for more than 4 hours.	
Storage	Store substance within a closed system.	
Storage,With occasional controlled exposure.	Store substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.10a.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ESVOC SPERC 4.10a.v1	Use as binders and release agents: Industrial (SU3)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	1
	Release fraction to wastewater from process (initial release prior to RMM):	0,00003
	Release fraction to soil from process (initial release prior to RMM):	0
Risk management measures		
Technical onsite conditions and measures to reduce or	Treat air emission to provide a typical removal efficiency of (%):	> 80

limit discharges, air emissions and releases to soil	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Soil emission controls are not applicable as there is no direct release to soil.	
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 15

Use as binders and release agents

ES Ref: 15 ES Type: Worker	Association ref code: 15

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC6, PROC8A, PROC8B, PROC10, PROC11, PROC14 SU22 ERC8a, ERC8c, ERC8d, ERC8f ESVOC SPERC 8.10b.v1
Processes, tasks activities covered	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing) and handling of waste. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC6, PROC8A, PROC8B, PROC10, PROC11, PROC14)

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
PROC6	Calendering operations
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
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Material transfers,(closed systems)	Handle substance within a closed system.	

Material transfers,(closed systems),With occasional controlled exposure.	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Material transfers,(closed systems),Batch process	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Drum/batch transfers	Use drum pumps or carefully pour from container.	
Mixing operations (closed systems)	Formulate in enclosed or ventilated mixing vessels.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Mixing operations (open systems)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Mold forming	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Casting operations,(open systems)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.,Wear a respirator conforming to EN140 with Type A filter or better.	
Spraying,Manual	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Minimise exposure by extracted full enclosure for the operation or equipment.	
Roller application or brushing,Manual	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Provide extract ventilation to points where emissions occur.,Wear a respirator conforming to EN140 with Type A filter or better.	
Spraying,Manual	Carry out in a vented booth or extracted enclosure.,Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Wear suitable gloves tested to EN374.,Wear a respirator conforming to EN140 with Type A filter or better.	
Storage	Store substance within a closed system.	
Storage,With occasional controlled exposure.	Store substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8c, ERC8d, ERC8f, ESVOC SPERC 8.10b.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8c	Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ERC8f	Wide dispersive outdoor use resulting in inclusion into or onto a matrix
ESVOC SPERC 8.10b.v1	Use as binders and release agents: Professional (SU22)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid
Vapour pressure	5840 Pa
	(25°C)

Operational conditions		
Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,95
	Release fraction to wastewater from process (initial release prior to RMM):	0,025
	Release fraction to soil from process (initial release prior to RMM):	0,025
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
Organizational measures to prevent/limit release from the site	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 16

Use in agrochemicals

ES Ref: 16 ES Type: Worker	Association ref code: 16

Use descriptors	PROC1, PROC2, PROC4, PROC8A, PROC8B, PROC11, PROC13 SU22 ERC8a, ERC8d ESVOC SPERC 8.11a.v1
Processes, tasks activities covered	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC4, PROC8A, PROC8B, PROC11, PROC13)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
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
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Transfer from/pouring from containers	Provide a good standard of controlled ventilation (5 to 15 air changes per hour).	
Mixing in containers.	Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	
Spraying/fogging by manual application	Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 4 hours.,Wear suitable gloves tested to EN374.,Wear a respirator	

	conforming to EN140 with Type A filter or better.	
Spraying/ fogging by machine application	Limit the substance content in the product to 25 %.,Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20.,Wear suitable gloves tested to EN374.	
Ad hoc manual application via trigger sprays, dipping, etc	Limit the substance content in the product to 25 %.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.,Wear suitable gloves tested to EN374.	
Equipment cleaning and maintenance,Non-dedicated facility	Avoid carrying out operation for more than 1 hour.,Wear suitable gloves tested to EN374.	
Disposal of wastes,Non-dedicated facility	Drain down system prior to equipment break-in or maintenance.,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.,Wear suitable gloves tested to EN374.	
Storage	Handle substance within a closed system.	
Storage,With occasional controlled exposure.	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.11a.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ESVOC SPERC 8.11a.v1	Agrochemical uses: Professional (SU22)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,9
	Release fraction to wastewater from process (initial release prior to RMM):	0,01
	Release fraction to soil from process (initial release prior to RMM):	0,09
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
Organizational measures to prevent/limit release from	Prevent environmental discharge consistent with regulatory requirements.	

the site		
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 17

Use in agrochemicals

ES Ref: 17 ES Type: Consumer	Association ref code: 13

Use descriptors	PC12, PC27 SU21 ERC8a, ERC8d ESVOC SPERC 8.11b.v1
Processes, tasks activities covered	Covers the consumer use of agrochemicals in liquid and solid forms. Consumer use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC12, PC27)

PC12	Fertilizers
PC27	Plant Protection products

Product characteristics	
Physical form	liquid
Concentration of the Substance in Mixture/Article	Unless otherwise stated., Covers concentrations up to 4.5%
Vapour pressure	950 Pa

Operational conditions		
Amount used	For each use event, covers use amounts up to: 0 g,Unless otherwise stated.	
	Covers skin contact area up to 857.5 cm²,Unless otherwise stated.	
Frequency and duration of use	Uses per day : 1,Unless otherwise stated.	
	Covers exposure up to,2 Hours/event,Unless otherwise stated.	
Other given operational conditions affecting consumers exposure	Fertilizers,Lawn and garden preparations	Unless otherwise stated. Covers concentrations up to 4.5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857.5 cm². For each use event, assumes swallowed amount of .... 0.3 g. Covers use in room size of 20 m³. Covers exposure up to 2. Hours/event
	Plant protection products	Unless otherwise stated. Covers concentrations up to 4.5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857.5 cm². For each use event, assumes swallowed amount of

		.... 0.3 g. Covers use in room size of 20 m³. Covers exposure up to 2. Hours/event

Risk management measures

Other risk management measures:

Fertilizers,Lawn and garden preparations	No other specific measures identified.	
Plant protection products	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.11b.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ESVOC SPERC 8.11b.v1	Agrochemical uses: Consumer (SU21)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	50000 t/yr
	Regional use tonnage (tons/year):	5000
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year): 365	
Environmental factors not influenced by risk management	Local freshwater dilution factor: 10	
	Local marine water dilution factor: 100	
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only): 0.9	
	Release fraction to wastewater from wide dispersive use: 0.01	
	Release fraction to soil from wide dispersive use (regional only): 0.09	
	Treat air emission to provide a typical removal efficiency of (%): 0	
	Typical onsite wastewater treatment technology provides removal efficiency of (%): 95.8	
	Prevent environmental discharge consistent with regulatory requirements.	
Risk management measures		
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m³/d): 2000	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA, Consumer

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 18

Fuels

ES Ref: 18 ES Type: Worker	Association ref code: 18

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC16 SU3, SU10 ERC7 ESVOC SPERC 7.12a.v1
Processes, tasks activities covered	Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC16)

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
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Bulk transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Drum/batch transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
General exposures (closed systems)	No specific measures identified.	

General exposures (closed systems),With occasional controlled exposure.	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
General exposures (closed systems),Batch process	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
General exposures (open systems),(closed systems)	No specific measures identified.	
General exposures (open systems),(closed systems),Batch process	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Equipment maintenance	Drain down and flush system prior to equipment break-in or maintenance.,Retain drain downs in sealed storage pending disposal or for subsequent recycle.	
Vessel and container cleaning	Provide extract ventilation to points where emissions occur.	
Storage	No specific measures identified.	
Storage,With occasional controlled exposure.	No specific measures identified.	
Disposal of wastes	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	

2.2 Contributing scenario controlling environmental exposure (ERC7, ESVOC SPERC 7.12a.v1)

ERC7	Industrial use of substances in closed systems
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,05
	Release fraction to wastewater from process (initial release prior to RMM):	0,00001
	Release fraction to soil from process (initial release prior to RMM):	0
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 95
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Soil emission controls are not applicable as there is no direct release to soil.	
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	

Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 19

Fuels

ES Ref: 19 ES Type: Worker	Association ref code: 19

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC16 SU22 ERC9a, ERC9b ESVOC SPERC 9.12b.v1
Processes, tasks activities covered	Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC16)

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
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Bulk transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Drum/batch transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Dipping, immersion and pouring	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	

General exposures (closed systems)	No specific measures identified.	
General exposures (closed systems),With occasional controlled exposure.	No specific measures identified.,Avoid carrying out activities involving exposure for more than 4 hours.	
General exposures (closed systems),Batch process	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
General exposures (open systems),(closed systems)	No specific measures identified.	
Equipment maintenance	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Vessel and container cleaning	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Storage	No specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b, ESVOC SPERC 9.12b.v1)

ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
ESVOC SPERC 9.12b.v1	Use as a fuel: Professional (SU22)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,01
	Release fraction to wastewater from process (initial release prior to RMM):	0,00001
	Release fraction to soil from process (initial release prior to RMM):	0,00001
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %

treatment plant	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 20

Fuels

ES Ref: 20 ES Type: Consumer	Association ref code: 20

Use descriptors	PC13 SU21 ERC9a, ERC9b ESVOC SPERC 9.12c.v1
Processes, tasks activities covered	Covers consumer uses in liquid fuels. Consumer use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC13)

PC13	Fuels

Product characteristics

Physical form	liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	950 Pa

Operational conditions

Amount used	For each use event, covers use amounts up to: 37500 g,Unless otherwise stated.	
	Covers skin contact area up to 420 cm²,Unless otherwise stated.	
Frequency and duration of use	Uses per day : 0.143,Unless otherwise stated.	
	Covers exposure up to,2 Hours/event,Unless otherwise stated.	
Other given operational conditions affecting consumers exposure	Fuels,Liquid: Automotive Refuelling	Unless otherwise stated. Covers concentrations up to 38%. Covers use up to 52. days/year. Uses per day : 1. Covers skin contact area up to 210 cm². For each use event, covers use amounts up to: 37500 g. Covers outdoor use. Covers use in room size of 100 m². Covers exposure up to 0.05. Hours/event
	Fuels,Liquid Scooter Refuelling	Unless otherwise stated. Covers concentrations up to 38%. Covers use up to 52. days/year. Uses per day : 1. Covers skin contact area up to 210 cm². For each use event, covers use amounts up to: 3750 g. Covers outdoor use. Covers use in room size of

		100 m². Covers exposure up to 0.03. Hours/event
	Fuels,Liquid, Garden equipment - Use	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 26. days/year. Uses per day : 1. For each use event, covers use amounts up to: 750 g. Covers outdoor use. Covers use in room size of 100 m². Covers exposure up to 2. Hours/event
	Fuels,Liquid: Garden equipment - Refuelling	Unless otherwise stated. Covers concentrations up to 38%. Covers use up to 26. days/year. Uses per day : 1. Covers skin contact area up to 420 cm². For each use event, covers use amounts up to: 750 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m². Covers exposure up to 0.03. Hours/event
	Fuels,Liquid: Lamp oil	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 52. days/year. Uses per day : 1. Covers skin contact area up to 210 cm². For each use event, covers use amounts up to: 100 g. Covers use in room size of 20 m². Covers exposure up to 0.01. Hours/event

Risk management measures

Other risk management measures:

Fuels,Liquid: Automotive Refuelling	No specific measures identified.	
Fuels,Liquid Scooter Refuelling	No specific measures identified.	
Fuels,Liquid, Garden equipment - Use	No specific measures identified.	
Fuels,Liquid: Garden equipment - Refuelling	No specific measures identified.	
Fuels,Liquid: Lamp oil	No specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b, ESVOC SPERC 9.12c.v1)

ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
ESVOC SPERC 9.12c.v1	Use as a fuel: Consumer (SU21)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid
Vapour pressure	5840 Pa

	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 t/yr
	Regional use tonnage (tons/year):	100
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year): 365	
Environmental factors not influenced by risk management	Local freshwater dilution factor: 10	
	Local marine water dilution factor: 100	
Other given operational conditions affecting environmental exposure	Release fraction to air from process	0,01
	Release fraction to wastewater from process	0,00001
	Release fraction to soil from process	0,00001
	Treat air emission to provide a typical removal efficiency of (%): 0	
	Typical onsite wastewater treatment technology provides removal efficiency of (%): 95.8	
	Do not apply industrial sludge to natural soils.,Sludge should be incinerated, contained or reclaimed.	
Risk management measures		
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA, Consumer

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 21

Polymer production

ES Ref: 21 ES Type: Worker	Association ref code: 21

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8A, PROC8B, PROC9, PROC14, PROC21 SU3, SU10 ERC4, ERC6c ESVOC SPERC 4.21a.v1
Processes, tasks activities covered	Manufacture of polymers from monomers in continuous and batch processes. Including production, re-cycling and recovery, degassing, discharging, reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation, product off-gassing). Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8A, PROC8B, PROC9, PROC14, PROC21)

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 (multistage and/or significant contact)
PROC6	Calendering operations
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)
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC21	Low energy manipulation of substances bound in materials and/or articles

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General exposures (closed systems),continuous,no sampling	No specific measures identified.	
Bulk transfers,Transport,with sample collection	Ensure material transfers are under containment or extract ventilation.	
Polymerisation (Bulk and batch),Continuous process,with sample collection	No specific measures identified.	
Polymerisation (Bulk and batch),Batch process,with sample collection	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Finishing operations,Batch process,with sample collection,Catalyst inactivation and removal, washing and stripping / distillation to remove unreacted monomer	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Intermediate polymer storage	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Additivation and stabilisation	Provide extract ventilation to points where emissions occur.	
Mixing in containers.,Batch process	Provide extract ventilation to points where emissions occur.	
Pelletising,Extrusion and masterbatching	Provide extract ventilation to points where emissions occur.,Avoid carrying out operation for more than 4 hours.	
Pelletising	Provide extract ventilation to points where emissions occur.	
Pelletisation and pellet screening	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Bulk transfers,Continuous process,with sample collection	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Ensure operation is undertaken outdoors.	
Transport,with sample collection	Ensure material transfers are under containment or extract ventilation.	
Equipment maintenance	Drain down and flush system prior to equipment break-in or maintenance.	
Storage,With occasional controlled exposure.	No specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC6c, ESVOC SPERC 4.21a.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC6c	Industrial use of monomers for manufacture of thermo-plastics
ESVOC SPERC 4.21a.v1	Polymer production: Industrial (SU10)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid
Vapour pressure	5840 Pa
	(25°C)

Operational conditions

Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	1

Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,01
	Release fraction to wastewater from process (initial release prior to RMM):	0,003
	Release fraction to soil from process (initial release prior to RMM):	0,0001
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 80
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 22

Polymer processing

ES Ref: 22 ES Type: Worker	Association ref code: 22

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8A, PROC8B, PROC9, PROC13, PROC14, PROC21 SU3, SU10 ERC4, ERC6d ESVOC SPERC 4.21a.v1
Processes, tasks activities covered	Processing of formulated polymers including material transfers, additives handling (e.g. pigments, stabilisers, fillers, plasticisers, etc.), moulding, curing and forming activities, material re-works, storage and associated maintenance. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8A, PROC8B, PROC9, PROC13, PROC14, PROC21)

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 (multistage and/or significant contact)
PROC6	Calendering operations
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)
PROC13	Treatment of articles by dipping and pouring
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC21	Low energy manipulation of substances bound in materials and/or articles

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational	

	hygiene is implemented.	

Risk management measures

Other risk management measures:

Bulk transfers,(closed systems)	Handle substance within a closed system.	
Bulk transfers,(closed systems),With occasional controlled exposure.	Handle substance within a closed system.	
Bulk transfers,Dedicated facility	Transfer via enclosed lines.	
Bulk weighing,(closed systems)	Handle substance within a closed system.	
Bulk weighing,With occasional controlled exposure.	Handle substance within a closed system.	
Small scale weighing	Ensure material transfers are under containment or extract ventilation.	
Additive premixing,(closed systems)	Ensure material transfers are under containment or extract ventilation.	
Additive premixing,(open systems),with sample collection	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Additive premixing,General exposures (open systems)	Ensure material transfers are under containment or extract ventilation.	
Bulk transfers,Drum/batch transfers	Transfer via enclosed lines.	
Bulk transfers,Small package filling	Transfer via enclosed lines.	
Calendering (including Banburys)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Production of articles by dipping and pouring	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Extrusion and masterbatching	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Injection moulding of articles	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Equipment maintenance	Drain down system prior to equipment break-in or maintenance.	
Storage,With occasional controlled exposure.	Store substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC6d, ESVOC SPERC 4.21a.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ESVOC SPERC 4.21a.v1	Polymer production: Industrial (SU10)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid
Vapour pressure	5840 Pa
	(25°C)

Operational conditions

Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300

Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,5
	Release fraction to wastewater from process (initial release prior to RMM):	0
	Release fraction to soil from process (initial release prior to RMM):	0,00001
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 80
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 23

Polymer processing

ES Ref: 23 ES Type: Worker	Association ref code: 23

Use descriptors	PROC1, PROC2, PROC8A, PROC8B, PROC14, PROC21 SU22 ERC8a, ERC8d ESVOC SPERC 8.21b.v1
Processes, tasks activities covered	Processing of formulated polymers including material transfers, moulding and forming activities, material re-works and associated maintenance. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC8A, PROC8B, PROC14, PROC21)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC21	Low energy manipulation of substances bound in materials and/or articles

Product characteristics

Physical form	Liquid, vapour pressure > 10 Pa.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Bulk transfers,(closed systems)	Handle substance within a closed system.	
Bulk transfers,(closed systems),With occasional controlled exposure.	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Material transfers	Transfer via enclosed lines.	
Injection moulding of articles	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	

Rework of articles	No specific measures identified.	
Equipment maintenance	Drain down system prior to equipment break-in or maintenance.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Storage	Handle substance within a closed system.,No specific measures identified.	
Storage,With occasional controlled exposure.	Handle substance within a closed system.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.21b.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ESVOC SPERC 8.21b.v1	Polymer production: Professional (SU22)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	50000 T
	Regional use tonnage (tons/year):	5000 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,98
	Release fraction to wastewater from process (initial release prior to RMM):	0,01
	Release fraction to soil from process (initial release prior to RMM):	0,01
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 24

Functional fluids

ES Ref: 24 ES Type: Worker	Association ref code: 24

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9 SU3, SU8, SU9 ERC7 ESVOC SPERC 7.13a.v1
Processes, tasks activities covered	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9)

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)

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Bulk transfers	No specific measures identified.	
Bulk transfers,With occasional controlled exposure.	No specific measures identified.	
Bulk transfers,Batch process	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Bulk transfers	Provide a good standard of general ventilation (not	

	less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Drum/batch transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation.	
Pelletising,(closed systems)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	
Filling / preparation of equipment from drums or containers	Use drum pumps or carefully pour from container.	
General exposures (closed systems)	No specific measures identified.	
General exposures (open systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
General exposures (open systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Provide extract ventilation to points where emissions occur.	
Remanufacture of reject articles	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Provide extract ventilation to points where emissions occur.	
Equipment maintenance	Drain down system prior to equipment break-in or maintenance.	
Storage	No specific measures identified.	
Storage,With occasional controlled exposure.	No specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC7, ESVOC SPERC 7.13a.v1)

ERC7	Industrial use of substances in closed systems
ESVOC SPERC 7.13a.v1	Functional fluids: Industrial (SU3)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,01
	Release fraction to wastewater from process (initial release prior to RMM):	0,0003
	Release fraction to soil from process (initial release prior to RMM):	0,001
Risk management measures		
Technical onsite conditions and measures to reduce or	Treat air emission to provide a typical removal	> 80

limit discharges, air emissions and releases to soil	efficiency of (%):	
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 25

Functional fluids

ES Ref: 25 ES Type: Worker	Association ref code: 25

Use descriptors	PROC1, PROC2, PROC3, PROC8A, PROC9, PROC20 SU22 ERC9a, ERC9b ESVOC SPERC 9.13b.v1
Processes, tasks activities covered	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8A, PROC9, PROC20)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC20	Heat and pressure transfer fluids in dispersive use but closed systems

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Drum/batch transfers,Non-dedicated facility	Use drum pumps or carefully pour from container.,Avoid carrying out operation for more than 4 hours.	
Transfer from/pouring from containers	Use drum pumps or carefully pour from container.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Filling / preparation of equipment from drums or	Use drum pumps or carefully pour from container.,Provide a good standard of general	

containers	ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
General exposures (closed systems)	No specific measures identified.	
General exposures (open systems),Elevated temperature : 80 °C	Provide extract ventilation to points where emissions occur.	
Remanufacture of reject articles	Drain down system prior to equipment break-in or maintenance.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Equipment maintenance,Non-dedicated facility	Drain down system prior to equipment break-in or maintenance.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Storage,With occasional controlled exposure.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b, ESVOC SPERC 9.13b.v1)

ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
ESVOC SPERC 9.13b.v1	Functional fluids: Professional (SU22)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,05
	Release fraction to wastewater from process (initial release prior to RMM):	0,025
	Release fraction to soil from process (initial release prior to RMM):	0,025
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8 %
	Assumed domestic sewage treatment plant flow	2000

	(m^3/d):	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 26

Functional fluids

ES Ref: 26 ES Type: Consumer	Association ref code: 20

Use descriptors	PC16, PC17 SU21 ERC9a, ERC9b ESVOC SPERC 9.13c.v1
Processes, tasks activities covered	Use of sealed items containing functional fluids e.g. transfer oils, hydraulic fluids, refrigerants. Consumer use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC16, PC17)

PC16	Heat Transfer Fluids
PC17	Hydraulic Fluids

Product characteristics	
Physical form	liquid
Concentration of the Substance in Mixture/Article	Limit the substance content in the product to 50 %.
Vapour pressure	950 Pa

Operational conditions		
Amount used	For each use event, covers use amounts up to: +,Unless otherwise stated.	
	Covers skin contact area up to 468 cm², Unless otherwise stated.	
Frequency and duration of use	Uses per day : 0.011,Unless otherwise stated.	
	Covers exposure up to,0.167 Hours/event,Unless otherwise stated.	
Other given operational conditions affecting consumers exposure	Unless otherwise stated.,Covers use at ambient temperatures.,Covers use in room size of 20 m³,Covers use under typical household ventilation.	
	Heat transfer fluids,Liquids	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm². For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0.17. Hours/event
	Hydraulic fluids,Liquids	Unless otherwise stated. Covers concentrations up to

		50%. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm^2. For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m^3. Covers exposure up to 0.17. Hours/event

Risk management measures

Other risk management measures:

Hydraulic fluids,Liquids	No specific measures identified.	
Heat transfer fluids,Liquids	No specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b, ESVOC SPERC 9.13c.v1)

ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
ESVOC SPERC 9.13c.v1	Functional fluids: Consumer (SU21)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	

Operational conditions

Amount used	Annual amount used in the EU	1000 t/yr
	Regional use tonnage (tons/year):	100
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year): 365	
Environmental factors not influenced by risk management	Local freshwater dilution factor: 10	
	Local marine water dilution factor: 100	
Other given operational conditions affecting environmental exposure	Release fraction to air from process	0,05
	Release fraction to wastewater from process	0,025
	Release fraction to soil from process	0,025
	Treat air emission to provide a typical removal efficiency of (%): 0	
	Typical onsite wastewater treatment technology provides removal efficiency of (%): 95.8	
	Do not apply industrial sludge to natural soils.	

Risk management measures

Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	

Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA, Consumer

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 27

Use in oil and gas field drilling and production operations

ES Ref: 27 ES Type: Worker	Association ref code: 24

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B SU3, SU10 ERC4 ESVOC SPERC 4.5a.v1
Processes, tasks activities covered	Oil field well drilling operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B)

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

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Bulk transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	
Filling/ preparation of equipment from drums or containers.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Avoid carrying out	

	operation for more than 1 hour.	
Drill floor operations	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Operation of solids filtering equipment - vapour exposures	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Operation of solids filtering equipment - aerosol exposures	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Operation of solids filtering equipment	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	
Treatment and disposal of filtered solids	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Process sampling	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
General exposures (closed systems)	No specific measures identified.	
Pouring from small containers	Use drum pumps or carefully pour from container.	
General exposures (open systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Equipment cleaning and maintenance	Use drum pumps or carefully pour from container.	
Batch process	No specific measures identified.	
Batch process,With occasional controlled exposure.	No specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.5a.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ESVOC SPERC 4.5a.v1	Use in oil field drilling and production operations: Industrial (SU3)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor: Not applicable	
	Local marine water dilution factor: Not applicable	
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM): Not applicable	
	Release fraction to wastewater from process (initial release prior to RMM): Not applicable	
	Release fraction to soil from process (initial release prior to RMM): Not applicable	

Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Discharge to aquatic environment is restricted (see Section 4.2).	
Organizational measures to prevent/limit release from the site	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to municipal sewage treatment plant	Not applicable	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 28

Use in oil and gas field drilling and production operations

ES Ref: 28 ES Type: Worker	Association ref code: 28

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B SU22 ERC8d ESVOC SPERC 4.5a.v1
Processes, tasks activities covered	Oil field well drilling operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B)

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

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Bulk transfers	Transfer via enclosed lines.	
Filling/ preparation of equipment from drums or containers.	Transfer via enclosed lines.	
Drill floor operations	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	

Operation of solids filtering equipment - vapour exposures	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Operation of solids filtering equipment - aerosol exposures	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Operation of solids filtering equipment	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Treatment and disposal of filtered solids	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Process sampling	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
General exposures (closed systems)	No specific measures identified.	
Pouring from small containers	Use drum pumps or carefully pour from container.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
General exposures (open systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance.	
Batch process	No specific measures identified.	
Batch process,With occasional controlled exposure.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,No specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8d, ESVOC SPERC 4.5a.v1)

ERC8d	Wide dispersive outdoor use of processing aids in open systems
ESVOC SPERC 4.5a.v1	Use in oil field drilling and production operations: Industrial (SU3)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid
Vapour pressure	5840 Pa
	(25°C)

Operational conditions

Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	Not applicable
Frequency and duration of use	Emission days (days/year): Not applicable	
Environmental factors not influenced by risk management	Local freshwater dilution factor: Not applicable	
	Local marine water dilution factor: Not applicable	
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM): Not applicable	
	Release fraction to wastewater from process (initial release prior to RMM): Not applicable	
	Release fraction to soil from process (initial release	

	prior to RMM): Not applicable	
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Discharge to aquatic environment is restricted (see Section 4.2).	
Organizational measures to prevent/limit release from the site	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to municipal sewage treatment plant	Not applicable	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 29

Road and construction applications

ES Ref: 29 ES Type: Worker	Association ref code: 29

Use descriptors	PROC7, PROC8A, PROC8B, PROC9, PROC10, PROC11, PROC13 SU22 ERC8d, ERC8f ESVOC SPERC 8.15.v1
Processes, tasks activities covered	Application of surface coatings and binders in road and construction activities, including paving uses, manual mastic and in the application of roofing and water-proofing membranes. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC7, PROC8A, PROC8B, PROC9, PROC10, PROC11, PROC13)

PROC7	Industrial spraying
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Drum/batch transfers,Non-dedicated facility	Use drum pumps or carefully pour from container.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Drum/batch transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation.,Provide a good standard of general ventilation (not less than 3 to 5 air changes	

	per hour).,or,Ensure operation is undertaken outdoors.	
Roller application or brushing,Manual	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Wear a respirator conforming to EN140 with Type A filter or better.	
Spraying/ fogging by machine application	Ensure operation is undertaken outdoors.,Provide extract ventilation to points where emissions occur.,or,Operate activity away from sources of substance emission or release.,Wear a respirator conforming to EN140 with Type A filter or better.	
Dipping, immersion and pouring	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Wear a respirator conforming to EN140 with Type A filter or better.	
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.,Provide extract ventilation to points where emissions occur.,or,Operate activity away from sources of substance emission or release.,Retain drain downs in sealed storage pending disposal or for subsequent recycle.	
Storage	No specific measures identified.	
Storage,With occasional controlled exposure.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	

2.2 Contributing scenario controlling environmental exposure (ERC8d, ERC8f, ESVOC SPERC 8.15.v1)

ERC8d	Wide dispersive outdoor use of processing aids in open systems
ERC8f	Wide dispersive outdoor use resulting in inclusion into or onto a matrix
ESVOC SPERC 8.15.v1	Road and Construction applications: Professional (SU22)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,95
	Release fraction to wastewater from process (initial release prior to RMM):	0,01
	Release fraction to soil from process (initial release prior to RMM):	0,04
Risk management measures		
Technical onsite conditions and measures to reduce or	Typical onsite wastewater treatment technology	

limit discharges, air emissions and releases to soil	provides removal efficiency of (%): 95.8%	
	Treat air emission to provide a typical removal efficiency of (%): >0	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
Conditions and measures related to municipal sewage treatment plant	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 30

Laboratory use

ES Ref: 30 ES Type: Worker	Association ref code: 30

Use descriptors	PROC10, PROC15 SU3, SU10 ERC2, ERC4
Processes, tasks activities covered	Use of the substance within laboratory settings, including material transfers and equipment cleaning. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC10, PROC15)

PROC10	Roller application or brushing
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Laboratory activities,small scale,Handling small quantities (<1000ml) for more than 4 hours/day - inside fume cupboard.	No specific measures identified.	
Cleaning,Rolling, Brushing,Vessel and container cleaning,Cleaning equipment, glassware etc under general ventilation for 15 min - 1 hour/day	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	

2.2 Contributing scenario controlling environmental exposure (ERC2, ERC4)

ERC2	Formulation of preparations
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid

Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,5
	Release fraction to wastewater from process (initial release prior to RMM):	0,5
	Release fraction to soil from process (initial release prior to RMM):	0
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Soil emission controls are not applicable as there is no direct release to soil.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 31

Laboratory use

ES Ref: 31 ES Type: Worker	Association ref code: 31

Use descriptors	PROC10, PROC15 SU22 ERC8a ESVOC SPERC 8.17.v1
Processes, tasks activities covered	Use of small quantities within laboratory settings, including material transfers and equipment cleaning. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC10, PROC15)

PROC10	Roller application or brushing
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Laboratory activities,small scale	No specific measures identified.	
Cleaning,Rolling, Brushing,Vessel and container cleaning,Cleaning equipment, glassware etc under general ventilation for 15 min - 1 hour/day	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Handle in a fume cupboard or under extract ventilation.	

2.2 Contributing scenario controlling environmental exposure (ERC8a)

ERC8a	Wide dispersive indoor use of processing aids in open systems
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid
Vapour pressure	5840 Pa

	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	0,002
Frequency and duration of use	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,5
	Release fraction to wastewater from process (initial release prior to RMM):	0,5
	Release fraction to soil from process (initial release prior to RMM):	0
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Soil emission controls are not applicable as there is no direct release to soil.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 32

Explosives manufacture & use

ES Ref: 32 ES Type: Worker	Association ref code: 32

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC15 SU3, SU8, SU9 ERC2 ESVOC SPERC 2.18.v1
Processes, tasks activities covered	Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC15)

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 characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Bulk transfers,1 - 4 hours,Ambient temperature	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Drum/batch transfers,1-4 hours,Ambient temperature	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	

Mixing in containers.,(closed systems),4 hours,Ambient temperature	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.	
Mixing in containers.,(open systems),4 hours,Ambient temperature	Provide extract ventilation to points where emissions occur.,Avoid carrying out operation for more than 4 hours.	
Material transfers,< 1 hours,Ambient temperature	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	
Transfer from/pouring from containers,Non-dedicated facility,< 1 hours,Ambient temperature	Use drum pumps.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	
Clean down and maintenance	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	
Equipment maintenance	Drain down system prior to equipment break-in or maintenance.,Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).	
Storage,daily,Ambient temperature	Ensure operation is undertaken outdoors.	

2.2 Contributing scenario controlling environmental exposure (ERC2, ESVOC SPERC 2.18.v1)

ERC2	Formulation of preparations
ESVOC SPERC 2.18.v1	Explosives manufacture: Industrial (SU3)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,0005
	Release fraction to wastewater from process (initial release prior to RMM):	0,0003
	Release fraction to soil from process (initial release prior to RMM):	0,0001
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 80
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8

	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Sludge should be incinerated, contained or reclaimed.	
	Do not apply industrial sludge to natural soils.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 33

Manufacture of rubber products

ES Ref: 33 ES Type: Worker	Association ref code: 33

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8A, PROC8B, PROC13, PROC14, PROC21 SU10 ERC1, ERC4, ERC6d ESVOC SPERC 4.19.v1
Processes, tasks activities covered	Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8A, PROC8B, PROC13, PROC14, PROC21)

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 (multistage and/or significant contact)
PROC6	Calendering operations
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
PROC13	Treatment of articles by dipping and pouring
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC21	Low energy manipulation of substances bound in materials and/or articles

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Material transfers	No specific measures identified.	
Material transfers,With occasional controlled exposure.	No specific measures identified.	
Material transfers,Dedicated facility,Large containers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	
Bulk weighing,(closed systems)	No specific measures identified.	
Bulk weighing,With occasional controlled exposure.	No specific measures identified.	
Small scale weighing,Dedicated facility	Ensure material transfers are under containment or extract ventilation.	
Additive premixing,Batch process,(closed systems)	Provide extract ventilation to material transfer points and other openings.	
Additive premixing	Provide extract ventilation to points where emissions occur.	
Material transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation.,Provide a good standard of controlled ventilation (5 to 15 air changes per hour).	
Material transfers,Small containers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,or,Ensure operation is undertaken outdoors.,Provide extract ventilation to points where emissions occur.	
Additive premixing,Mixing operations (open systems)	Provide extract ventilation to points where emissions occur.	
Calendering (including Banburys)	Restrict area of openings to equipment.,Provide extract ventilation to points where emissions occur.	
Calendering (including Banburys)	Restrict area of openings to equipment.,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).,Avoid carrying out operation for more than 1 hour.	
Pressing uncured rubber blanks	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Vulcanisation	Restrict area of openings to equipment.,Provide extract ventilation to points where emissions occur.	
Cooling cured articles	Provide extract ventilation to points where emissions occur.	
Laboratory activities	Handle in a fume cupboard or under extract ventilation.	
Equipment maintenance	Drain or remove substance from equipment prior to break-in or maintenance.,Retain drain downs in sealed storage pending disposal or for subsequent recycle.	

2.2 Contributing scenario controlling environmental exposure (ERC1, ERC4, ERC6d, ESVOC SPERC 4.19.v1)

ERC1	Manufacture of substances
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ESVOC SPERC 4.19.v1	Rubber production and processing: Industrial (SU10)
Assessment method	EUSES v2.1

Product characteristics

Physical form	Medium volatile liquid

Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,01
	Release fraction to wastewater from process (initial release prior to RMM):	0,003
	Release fraction to soil from process (initial release prior to RMM):	0,0001
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 0
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
	Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
Conditions and measures related to external treatment of waste for disposal	This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels

4.2. Environment	
Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Exposure scenario 34

Mining chemicals

ES Ref: 34 ES Type: Worker	Association ref code: 33

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8B, PROC9 SU3, SU8, SU9 ERC4 ESVOC SPERC 4.19.v1
Processes, tasks activities covered	Covers the use of the substance in extraction processes at mining operations, including material transfers, winning and separation activities, and substance recovery and disposal. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC8B, PROC9)

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 (multistage and/or significant contact)
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)

Product characteristics

Physical form	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

Bulk transfers,With occasional controlled exposure.	No specific measures identified.	
Drum/batch transfers,Dedicated facility	Use drum pumps.	
Pouring from small containers	Provide a good standard of controlled ventilation (not less than 3 to15 air changes per hour),Avoid carrying out operation for more than 1 hour.	
General exposures (closed systems),Batch process	Provide a good standard of controlled ventilation (not	

	less than 3 to15 air changes per hour),or,Ensure operation is undertaken outdoors.	
General exposures (open systems)	Provide extract ventilation to points where emissions occur.	
phase separation,(closed systems)	Provide a good standard of controlled ventilation (not less than 3 to15 air changes per hour),or,Ensure operation is undertaken outdoors.	
ion exchange processes,(closed systems),With occasional controlled exposure.	No specific measures identified.	
Process sampling,Batch process,(closed systems)	Provide a good standard of controlled ventilation (not less than 3 to15 air changes per hour),or,Ensure operation is undertaken outdoors.	
Mixing in containers.,(closed systems)	No specific measures identified.	
Equipment cleaning and maintenance,Non-dedicated facility	Provide a good standard of controlled ventilation (not less than 3 to15 air changes per hour),or,Ensure operation is undertaken outdoors.,Avoid carrying out operation for more than 1 hour.	
General exposures (closed systems)	No specific measures identified.	
General exposures (closed systems),With occasional controlled exposure.	No specific measures identified.	
Storage	No specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.19.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ESVOC SPERC 4.19.v1	Rubber production and processing: Industrial (SU10)
Assessment method	EUSES v2.1

Product characteristics		
Physical form	Medium volatile liquid	
Vapour pressure	5840 Pa	
	(25°C)	
Operational conditions		
Amount used	Annual amount used in the EU	1000 T
	Regional use tonnage (tons/year):	100 T
	Fraction of the main local source	1
Frequency and duration of use	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,25
	Release fraction to wastewater from process (initial release prior to RMM):	0,5
	Release fraction to soil from process (initial release prior to RMM):	0,05
Risk management measures		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	> 80
	Typical onsite wastewater treatment technology provides removal efficiency of (%):	95,8
	Prevent discharge of undissolved substance to or	

	recover from onsite wastewater.	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.8	
	Assumed domestic sewage treatment plant flow (m^3/d): 2000	
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	ECETOC TRA v2.0 Worker

3.2. Environment

Information for contributing exposure scenario	
2.2	EUSES v2.1

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	When the recommended risk management measures (RMMs) and aperational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.