

TOLUENE

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830
 Date of issue: 10/10/2017 Supersedes: 5/5/2017 Version: 13.5

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

1.1. Product identifier

Product form : Substance
 Substance name : TOLUENE
 EC-No. : 203-625-9
 CAS-No. : 108-88-3
 REACH registration No : Total Olefins Antwerp (01-2119471310-51-0013) - Total Raffinage France (01-2119471310-51-0042)
 Synonyms : 108-88-3
 Product group : -

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

1.2.1. Relevant identified uses

 Main use category : Professional use
 Use of the substance/mixture :
 Manufacture of substances
 Distribution of substance
 Formulation & (re)packing of substances and mixtures
 Synthesis intermediate
 Cleaner
 Use as a fuel.
 Coating
 Use in Agrochemicals
 Polymer production
 Polymer preparations and compounds
 Rubber production and processing
 Functional Fluids
 Use as binders and release agents
 Use in Oil field drilling and production operations
 Road and construction applications
 Use in laboratories
 For the detailed uses of the product see annex of the safety data sheet

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

REFINING & CHEMICALS BRANCH
 TOTAL PETROCHEMICALS & REFINING SA/NV
 Rue de l'Industrie 52 Nijverheidsstraat - B-1040 BRUSSELS - BELGIUM
 T +32 (0)2.288.91.11
rc.fer-sds@total.com - www.total.com

1.4. Emergency telephone number

Emergency number : Emergency call Carechem 24 International :
 • for English speaking countries: +44 (0) 1235 239 670
 • for Europe (in local languages): + 33 1 49 00 00 49
 • for Africa and Middle East: + 44 (0) 1235 239 671 • for China:
 + 86 10 5100 3039
 • for Asia Pacific (Hong-Kong, Singapore, Taiwan, Philippines, India, Vietnam, Sri Lanka, Japan, Korea, Malaysia, Indonesia, Thailand) :
 + 65 3158 1074

Country	Organisation/Company	Address	Emergency number	Comment
	National Poisons Emergency number		08 45 46 47	
Ireland	National Poisons Information Centre Beaumont Hospital	PO Box 1297 Beaumont Road 9 Dublin	+353 1 809 2566 (Healthcare professionals-24/7) +353 1 809 2166 (public, 8am - 10pm, 7/7)	



TOLUENE

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Flammable liquids, Category 2	H225
Skin corrosion/irritation, Category 2	H315
Reproductive toxicity, Category 2	H361d
Specific target organ toxicity — Single exposure, Category 3, Narcosis	H336
Specific target organ toxicity — Repeated exposure, Category 2	H373
Aspiration hazard, Category 1	H304
Hazardous to the aquatic environment — Chronic Hazard, Category 3	H412

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

Flammable liquid and vapour. May be fatal if swallowed and enters airways. Suspected of damaging the unborn child. Causes skin irritation. May cause drowsiness or dizziness. Harmful to aquatic life with long lasting effects.

2.2. Label elements

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

Hazard pictograms (CLP) :



Signal word (CLP) :

Danger

Hazard statements (CLP) :

H225 - Highly flammable liquid and vapour.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H336 - May cause drowsiness or dizziness.
H361d - Suspected of damaging the unborn child.
H373 - May cause damage to organs through prolonged or repeated exposure.
H412 - Harmful to aquatic life with long lasting effects.

P201 - Obtain special instructions before use.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P243 - Take precautionary measures against static discharge.
P262 - Do not get in eyes, on skin, or on clothing.
P273 - Avoid release to the environment.
P281 - Use personal protective equipment as required.
P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P309+P311 - IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.
P403+P235 - Store in a well-ventilated place. Keep cool.

Precautionary statements (CLP) :

2.3. Other hazards

Other hazards not contributing to the classification

: In use, may form flammable/explosive vapour-air mixture. Handling this product may result in electrostatic accumulation. Use proper grounding procedures.

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	: TOLUENE
CAS-No.	: 108-88-3
EC-No.	: 203-625-9



TOLUENE

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Toluene	(CAS-No.) 108-88-3 (EC-No.) 203-625-9	> 99.6	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361d STOT SE 3, H336 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Chronic 3, H412

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: Get medical advice/attention if you feel unwell.
First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing. Call a physician immediately. If breathing is difficult, give oxygen. If breathing stops, give artificial respiration. Place under medical observation.
First-aid measures after skin contact	: Take off immediately all contaminated clothing. Wash with plenty of water/.... Get medical advice if skin irritation persists.
First-aid measures after eye contact	: Immediately rinse with water for a prolonged period while holding the eyelids wide open. Consult an eye specialist.
First-aid measures after ingestion	: Do not give anything to drink. Do not induce vomiting. If swallowed, rinse mouth with water (only if the person is conscious). Take immediately victim to hospital.

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

Symptoms/effects : Refer to § 11 for more details on effects.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Carbon dioxide. Dry powder. Foam.
Unsuitable extinguishing media	: Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Explosion hazard	: Heavier than air, vapours may travel long distances along ground, ignite and flash back to source. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.
Hazardous decomposition products in case of fire	: Toxic fumes. Carbon oxides (CO, CO ₂). Aldehydes. Polycyclic-aromatic hydrocarbons (PAH). Carbon (C). Ketones.

5.3. Advice for firefighters

Protection during firefighting	: Complete protective clothing. Do not enter fire area without proper protective equipment, including respiratory protection.
Other information	: Notify fire brigade and environmental authorities. Evacuate unnecessary personnel. Use water spray or fog for cooling exposed containers.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : No flames, no sparks. Eliminate all sources of ignition. Do not smoke. Use special care to avoid static electric charges. Prevent any contact with hot surfaces.

6.1.1. For non-emergency personnel

Protective equipment	: Do not attempt to take action without suitable protective equipment. Gloves. Safety glasses.
Emergency procedures for non-emergency personnel	: Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment	: Do not attempt to take action without suitable protective equipment. Breathing apparatus.
Emergency procedures for emergency responders	: Evacuate unnecessary personnel. Eliminate all ignition sources if safe to do so.



TOLUENE

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : If spilled, may cause the floor to be slippery. Sweep up or vacuum up the product. Dike for recovery or absorb with appropriate material. Take up liquid spill into absorbent material, e.g.: sand, saw dust. On water, recover/skim from surface and pour out in disposal container.

Other information : Dispose of contaminated material at an authorized site. Notify authorities if product enters sewers or public waters.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station. In use, may form flammable/explosive vapour-air mixture. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge during blending and transfer operations. Explosion-free electrical equipment and lighting with earth.

Hygiene measures : Do not eat, drink or smoke when using this product. Keep away from food and drink. Always wash hands after handling the product. Take off contaminated clothing.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed.

Storage conditions : Store in a well-ventilated place. Keep container tightly closed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Containers (tanks) should be grounded and provided with adequate pressure relief valve. Explosive vapour/air mixtures may be formed.

Storage area : Store away from heat. Earth the equipment. Store in a well-ventilated place.

Packaging materials : Stainless steel.

7.3. Specific end use(s)

Recommended to professional users.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Toluene (108-88-3)		
EU	IOELV TWA (mg/m ³)	192 mg/m ³
EU	IOELV TWA (ppm)	50 ppm
EU	IOELV STEL (mg/m ³)	384 mg/m ³
EU	IOELV STEL (ppm)	100 ppm
Ireland	OEL (8 hours ref) (mg/m ³)	192 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	50 ppm
Ireland	OEL (15 min ref) (mg/m ³)	384 mg/m ³
Ireland	OEL (15 min ref) (ppm)	100 ppm
United Kingdom	WEL TWA (mg/m ³)	191 mg/m ³
United Kingdom	WEL TWA (ppm)	50 ppm
United Kingdom	WEL STEL (mg/m ³)	384 mg/m ³
United Kingdom	WEL STEL (ppm)	100 ppm
USA - ACGIH	ACGIH TWA (ppm)	20 ppm
USA - ACGIH	Biological Exposure Indices (BEI)	0.02 mg/l (Medium: blood - Time: prior to last shift of workweek - Parameter: Toluene) 0.03 mg/l (Medium: urine - Time: end of shift - Parameter: Toluene) 0.3 mg/g Kreatinin (Medium: urine - Time: end of shift - Parameter: o-Cresol with hydrolysis (background))

TOLUENE (108-88-3)

DNEL/DMEL (Workers)	
Acute - systemic effects, inhalation	384 mg/m ³
Acute - local effects, inhalation	384 mg/m ³
Long-term - systemic effects, dermal	384 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	192 mg/m ³
Long-term - local effects, inhalation	192 mg/m ³



TOLUENE

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

TOLUENE (108-88-3)	
DNEL/DMEL (General population)	
Acute - systemic effects, inhalation	226 mg/m ³
Acute - local effects, inhalation	226 mg/m ³
Long-term - systemic effects, oral	8.13 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	56.5 mg/m ³
Long-term - systemic effects, dermal	226 mg/kg bodyweight/day
PNEC (Water)	
PNEC aqua (freshwater)	0.68 mg/l
PNEC aqua (marine water)	0.68 mg/l
PNEC (Sediment)	
PNEC sediment (freshwater)	16.39 mg/kg dwt
PNEC sediment (marine water)	16.39 mg/kg dwt
PNEC (Soil)	
PNEC soil	2.89 mg/kg dwt
PNEC (STP)	
PNEC sewage treatment plant	13.61 mg/l

8.2. Exposure controls

Appropriate engineering controls:

The substance is flammable and therefore the following conditions must be met to ensure safe use: "Risks are controlled by storage and use under conditions which avoid all ignition sources."

. Ensure adequate ventilation. Safety shower. Eye fountain.

Personal protective equipment:

Gas mask with filter type A.

Hand protection:

hydrocarbons resistant gloves. In case of repeated or prolonged contact wear gloves. recommended material: fluorinated polymer. polyvinyl alcohol. Layer thickness : all thicknesses. Breakthrough time : > 480 min. EN 374-3. In the event of contact with the liquid: Nitrile rubber gloves. Layer thickness : > 0,30 mm. Breakthrough time : > 60 min. EN 374-3. Gloves may degrade in contact with this chemical.

• Carefully check the glove for cracks or damage before reusing it, dispose of gloves where the penetration time is exceeded. • The penetration time depends on temperature, glove material, thickness and construction.

Penetration time is measured against EN 374 in laboratory conditions corresponding to permanent static contact and is not necessarily representative of the risk in the workplace. Contact the gloves' supplier for further information on the selection and resistance of gloves.

Eye protection:

Safety glasses. Do not wear contact lenses

Skin and body protection:

Wear suitable protective clothing. Safety foot-wear

Respiratory protection:

Where exposure through inhalation may occur from use, respiratory protection equipment is recommended



Environmental exposure controls:

Avoid release to the environment. Assure that emissions are compliant with all applicable air pollution control regulations.

Other information:

Handle in accordance with good industrial hygiene and safety procedures. Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Molecular mass	: 92 g/mol
Colour	: Colourless.
Odour	: Aromatic.
Odour threshold	: No data available



TOLUENE

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

pH	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: -95 °C
Freezing point	: No data available
Boiling point	: 110.6 °C
Flash point	: 4 °C
Auto-ignition temperature	: 480 °C
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: 29 hPa (20°C)
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Density	: 867 kg/m ³
Solubility	: insoluble. Water: 573 - 587 mg/l
Log Pow	: 2.7
Viscosity, kinematic	: 0.56 mm ² /s (20°C)
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: 1.1 - 7.1 vol %

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Flammable liquid and vapour.

10.2. Chemical stability

Stable at ambient temperature and under normal conditions of use.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

No flames, no sparks. Eliminate all sources of ignition. High temperature. Heat.

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: Not classified
Additional information	: Inhalation may affect the nervous system causing headache, possibly dizziness, nausea, weakness, loss of coordination and unconsciousness

Toluene (108-88-3)	
LD50 oral rat	> 5000 mg/kg
LD50 dermal rabbit	> 5000 mg/kg
LC50 inhalation rat	28.1 (28.1 - 49) mg/l/4h
LC50 inhalation rat (ppm)	> 26700 ppm/1h

Skin corrosion/irritation	: Causes skin irritation.
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitisation	: Not classified
Additional information	: Based on available data, the classification criteria are not met
Germ cell mutagenicity	: Not classified Based on available data, the classification criteria are not met
Carcinogenicity - Description	: Not classified
Additional information	: Based on available data, the classification criteria are not met



TOLUENE

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Reproductive toxicity	: Suspected of damaging the unborn child.
STOT-single exposure	: May cause drowsiness or dizziness.
STOT-repeated exposure	: May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard	: May be fatal if swallowed and enters airways.
Additional information	: In case of accidental swallowing, due to its low viscosity, the product may be aspirated into the lung and induce a chemical pneumonitis developing over a few hours

TOLUENE (108-88-3)	
Viscosity, kinematic	0.56 mm ² /s (20°C)

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: Harmful to aquatic life with long lasting effects. Do not allow product to spread into the environment.
Ecology - air	: Product evaporates when in contact with the air.
Ecology - water	: the product spreads out on the surface of the water, a small fraction of the constituents may be dissolved.

TOLUENE (108-88-3)	
NOEC (chronic)	0.74 mg/l (Ceriodaphnia dubia)
Toluene (108-88-3)	
LC50 fish 1	15.22 - 19.05 mg/l (Pimephales promelas)
LC50 fish 2	12.6 mg/l (Pimephales promelas)
EC50 Daphnia 1	5.46 - 9.83 mg/l (Daphnia magna)
EC50 Daphnia 2	11.5 mg/l (Daphnia magna)
EC50 other aquatic organisms 1	> 433 mg/l (Pseudokirchneriella subcapitata)
EC50 other aquatic organisms 2	12.5 mg/l (Pseudokirchneriella subcapitata)

12.2. Persistence and degradability

TOLUENE (108-88-3)	
Persistence and degradability	Inherently biodegradable.

12.3. Bioaccumulative potential

TOLUENE (108-88-3)	
Log Pow	2.7
Toluene (108-88-3)	
Log Pow	2.65

12.4. Mobility in soil

TOLUENE (108-88-3)	
Ecology - soil	Avoid sub-soil penetration. it may pass through the soil and is likely to contaminate ground water.

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Hazardous waste. Dispose of in accordance with relevant local regulations. Use only registered transporters. Do not discharge the product into the environment. Empty containers should be taken for recycling, recovery or waste in accordance with local regulation.

Additional information : Handle empty containers with care because residual vapours are flammable.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	ADN	RID
14.1. UN Number				
1294	1294	1294	1294	1294
14.2. UN proper shipping name				
TOLUENE	TOLUENE	Toluene	TOLUENE	TOLUENE



TOLUENE

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

ADR	IMDG	IATA	ADN	RID
Transport document description				
UN 1294 TOLUENE, 3, II, (D/E)	UN 1294 TOLUENE, 3, II (7°C c.c.)	UN 1294 Toluene, 3, II	UN 1294 TOLUENE, 3, II	UN 1294 TOLUENE, 3, II
14.3. Transport hazard class(es)				
3	3	3	3	3
				
14.4. Packing Group				
II	II	II	II	II
14.5. Environmental hazards				
Dangerous for the environment : No	Dangerous for the environment : No Marine Pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No	Dangerous for the environment : No
No supplementary information available				

14.6. Special precautions for user

- Overland transport

Classification code (ADR)	: F1
Limited quantities (ADR)	: 1I
Excepted quantities (ADR)	: E2
Packing instructions (ADR)	: P001, IBC02, R001
Mixed packing provisions (ADR)	: MP19
Portable tank and bulk container instructions (ADR)	: T4
Portable tank and bulk container special provisions (ADR)	: TP1
Tank code (ADR)	: LGBF
Vehicle for tank carriage	: FL
Transport category (ADR)	: 2
Special provisions for carriage - Operation (ADR)	: S2, S20
Hazard identification number (Kemler No.)	: 33
Orange plates	: 

Tunnel restriction code (ADR)	: D/E
EAC code	: 3YE

- Transport by sea (IMDG)

Limited quantities (IMDG)	: 1 L
Excepted quantities (IMDG)	: E2
Packing instructions (IMDG)	: P001
IBC packing instructions (IMDG)	: IBC02
Tank instructions (IMDG)	: T4
Tank special provisions (IMDG)	: TP1
EmS-No. (Fire)	: F-E
EmS-No. (Spillage)	: S-D
Stowage category (IMDG)	: B
Flash point (IMDG)	: 7°C c.c.

- Air transport (IATA)

PCA Excepted quantities (IATA)	: E2
PCA Limited quantities (IATA)	: Y341
PCA limited quantity max net quantity (IATA)	: 1L
PCA packing instructions (IATA)	: 353



TOLUENE

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

PCA max net quantity (IATA) : 5L
CAO packing instructions (IATA) : 364
CAO max net quantity (IATA) : 60L
ERG code (IATA) : 3L

- Inland waterway transport

Classification code (ADN) : F1
Limited quantities (ADN) : 1 L
Excepted quantities (ADN) : E2
Carriage permitted (ADN) : T
Equipment required (ADN) : PP, EX, A
Ventilation (ADN) : VE01
Number of blue cones/lights (ADN) : 1

- Rail transport

Classification code (RID) : F1
Limited quantities (RID) : 1L
Excepted quantities (RID) : E2
Packing instructions (RID) : P001, IBC02, R001
Mixed packing provisions (RID) : MP19
Portable tank and bulk container instructions (RID) : T4
Portable tank and bulk container special provisions (RID) : TP1
Tank codes for RID tanks (RID) : LGBF
Transport category (RID) : 2
Colis express (express parcels) (RID) : CE7
Hazard identification number (RID) : 33

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

Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

The following restrictions are applicable according to Annex XVII of the REACH Regulation (EC) No 1907/2006:

3. Liquid substances or mixtures which are regarded as dangerous in accordance with Directive 1999/45/EC or are fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008	Toluene
3(a) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F	TOLUENE - Toluene
3(b) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10	TOLUENE - Toluene
3(c) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard class 4.1	TOLUENE - Toluene
40. Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not.	Toluene
48. Toluene	TOLUENE - Toluene

TOLUENE is not on the REACH Candidate List

TOLUENE is not on the REACH Annex XIV List

Other information, restriction and prohibition regulations : Annex XVII : 48. Toluene : Shall not be placed on the market, or used, as a substance or in mixtures in a concentration equal to or greater than 0,1 % by weight where the substance or mixture is used in adhesives or spray paints intended for supply to the general public.



TOLUENE

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

15.1.2. National regulations

Listed on ELINCS (European List of Notified Chemical Substances)
Listed on the Korean ECL (Existing Chemicals List)
Complies the United States TSCA (Toxic Substances Control Act) inventory
Listed on the Canadian DSL (Domestic Substances List)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on the Philippines Inventory of Chemicals and Chemical Substances (PICCS)
Listed on the China Inventory of Existing Chemical Substances (IECSC)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on NZIoC (New Zealand Inventory of Chemicals)

15.2. Chemical safety assessment

A chemical safety assessment has been carried out

SECTION 16: Other information

Training advice : Training staff on good practice. Manipulations are to be done only by qualified and authorised persons.

Other information : Use good personal hygiene practices.

Full text of H- and EUH-statements:

Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
Asp. Tox. 1	Aspiration hazard, Category 1
Flam. Liq. 2	Flammable liquids, Category 2
Repr. 2	Reproductive toxicity, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

SDS EU (REACH Annex II)

This information applies to the PRODUCT AS SUCH and conforming to specifications of TOTAL.

In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear.

The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. However the revision of some data is in progress.

Users are advised of possible additional hazards when the product is used in applications for which it was not intended. This sheet shall only be used and reproduced for prevention and security purposes.

The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive.

It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product.

It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product. (usage, storage, cleaning of containers, other processes) the totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment.



Annex: Exposure Scenarios for Toluene

Contents

1. Exposure scenario 1: Manufacture of toluene	2
2. Exposure scenario 2: Distribution of toluene	6
3. Exposure scenario 3: Use of toluene as an intermediate	10
4. Exposure scenario 4: Use of toluene in roads and construction – Professional	12
5. Exposure scenario 5: Use of toluene in cleaning agents- Industrial	16
6. Exposure scenario 6: Use of toluene in cleaning agents – Professional -	20
7. Exposure scenario 7: Use of toluene as a fuel – Industrial	24
8. Exposure scenario 8: Use of toluene as a fuel – Professional	28
9. Exposure scenario 9: Use of toluene as a fuel – Consumer	31
10. Exposure scenario 10: Use of toluene in coatings – Industrial	35
11. Exposure scenario 11: Use of toluene in coatings – Professional	39
12. Exposure assessment 12: Use of toluene in coatings – Consumer	43
13. Exposure assessment 13: Use of toluene in oilfield drilling and production operations – Industrial	50
14. Exposure assessment 14: Use of toluene in binders and release agents – Industrial	54
15. Exposure assessment 15: Use of toluene in binders and release agents – Professional	59
16. Exposure assessment 16: Use of toluene as a laboratory reagent – Industrial	63
17. Exposure assessment 17: Use of toluene as a laboratory reagent – Professional	66
18. Exposure assessment 18: Use of toluene in functional fluids – Industrial	69
19. Exposure assessment 19: Use of toluene in functional fluids – Professional	73
20. Exposure assessment 20: Use of toluene in rubber production and processing – Industrial	76
21. Exposure assessment 21: Formulation of toluene	80
22. Exposure assessment 22: Use of toluene in polymer production – Industrial	84
23. Exposure assessment 23: Use of toluene in polymer processing – Industrial	88
24. Exposure assessment 24: Use of toluene in polymer processing – Professional	92
25. Exposure assessment 25: Use of toluene in agrochemical use – Professional	96
26. Exposure assessment 26: Use of toluene in agrochemical use – Consumer	99



1. Exposure scenario 1: Manufacture of toluene - Industrial

1.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Manufacture of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU8, SU9)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15
	Environmental Release Categories: ERC1
Processes, tasks, activities covered	Manufacture of Substance A or use as an intermediate or process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
General exposures (closed systems) [CS15].	No specific measures identified [E118].
General exposures (closed systems) [CS15]. With sample collection [CS56]. With occasional controlled exposure [CS137]	No specific measures identified [E118].
General exposures (closed systems) [CS15]. Use in contained batch processes [CS37].	No specific measures identified [E118].



General exposures (open systems) [CS16]. Batch process [CS55]. With sample collection [CS56].	No specific measures identified [E118].
Process sampling [CS2].	Provide a good standard or general ventilation (not less than 3-5 air changes per hour [E11] or wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]
Laboratory activities [CS36].	No specific measures identified [E118].
Bulk transfers [CS14]. (open systems) [CS108]With potential for aerosol generation [CS138].	Provide a good standard or general ventilation (not less than 3-5 air changes per hour [E11] or Operate activity away from sources of emissions or release [E77], alternatively, if technical measures not practicable [G16] Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]
Bulk transfers [CS14]. (closed systems) [CS107];	Provide a good standard or general ventilation (not less than 3-5 air changes per hour [E11] or Operate activity away from sources of emissions or release [E77], alternatively, if technical measures not practicable [G16] Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]
Equipment cleaning and maintenance [CS39].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts Used	EU tonnage	3000 ktons/year	
	Regional tonnage	300 ktons/year	
	Fraction of main local source	1.00E+00	
Frequency and duration of use	Emission days per year	300	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	40	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 1.1.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.005	
	Release fraction to waste water from process before RMM	0.0001	
	Release fraction to soil from process before RMM	0.0001	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >90%.		
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3% [TCR 11]		



Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]
Conditions and measures related to external treatment of waste for disposal	ETW 4: During manufacturing no waste of the substance is generated.
Conditions and measures related to external recovery of waste	ERW 2: During manufacturing no waste of the substance is generated.
Other environmental control measures additional to above	None

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes	
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Basis for scaling	Environment
	Risk-driving Compartment – Sewage Treatment Plant
	Msafe : 4.07E+06 kg/day after RMM
Site Use	300 ktons/year
Onsite risk management measures	93.3 % efficiency water treatment in STP, 90 % removal efficiency air emission
Dilution factors	Freshwater
	40



	Marine water	100
Initial release percent at site to water (before RMM)		0.3
Typical release to water after RMM		8.52E-02 mg/l



2. Exposure scenario 2: Distribution of toluene - Industrial

2.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Distribution of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU8, SU9)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15
	Environmental Release Categories: ERC1 (loading) ERC2 (repacking)
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
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient , unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures , 4. Personal protection. Phrases between brackets are good practice advice only.
General exposures (closed systems) [CS15]. ; With sample collection [CS56]. With occasional controlled exposure [CS137]	No specific measures identified [E18].
General exposures (closed systems) [CS15]. Use in contained batch processes [CS37].	No specific measures identified [E18].



General exposures (open systems) [CS16]. Batch process [CS55]. ; With sample collection [CS56].	No specific measures identified [E18].
Process sampling [CS2].	No specific measures identified [E18].
Laboratory activities [CS36].	No specific measures identified [E18].
Bulk transfers [CS14]. ; (closed systems) [CS107]	No specific measures identified [E18].
Bulk transfers [CS14]. ; (open systems) [CS108]	Provide a good standard or general ventilation (not less than 3-5 air changes per hour [E11] or Operate activity away from sources of emissions or release [E77], alternatively, if technical measures not practicable [G16] Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]
Drum and small package filling [CS6].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11] or Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]
Equipment cleaning and maintenance [CS39].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. or Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]
Storage [CS67] with occasional controlled exposure [CS137]	Drain down and flush system prior to equipment break-in or maintenance [E55].
	No specific measures identified [E18].

Section 2.2		
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1	
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.	
Amounts Used	EU tonnage	3000 ktons/year
	Regional tonnage	300 ktons/year
	Fraction of main local source	1.00E+00
Frequency and duration of use	Emission days per year	300
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Conditions given in SPERC fact sheet (ESVOC SpERC 1.1b.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.0001
	Release fraction to waste water from process before RMM	0.00001
	Release fraction to soil from process before RMM	0.00001



Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >90%.
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other environmental control measures additional to above	None

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes	
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Basis for scaling	Environment



	Risk-driving Compartment – Soil	
	Msafe: 1.36 E+07kg/day after RMM	
Site Use	300 ktons/year	
Onsite risk management measures	93.3 % efficiency water treatment in STP, 90 % removal efficiency air emission	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.001	
Typical release to water after RMM	3.49E-02 mg/l	



3. Exposure scenario 3: Use of toluene as an intermediate

For the worker exposure assessment, see section 1 of Exposure Scenario 1, manufacture of toluene.

3.1. Exposure scenario

Section 2.2	Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1	
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.	
Amounts Used	EU tonnage	120ktons/year
	Regional tonnage	12 ktons/year
	Fraction of main local source	1.00E+00
Frequency and duration of use	Emission days per year	300
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Conditions given in SPERC fact sheet (ESVOC SpERC 6.1a.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.002
	Release fraction to waste water from process before RMM	0.003
	Release fraction to soil from process before RMM	0.001
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >80%.	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
	Prevent discharge of undissolved substance to or recover from wastewater [TCR14].	
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils [OMS2].	
	Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment is 93.3 (%) [STP3]	
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]	
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. [ETW 5]	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated. [EWR 3]	



Other environmental control measures additional to above	None
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Section 3	Exposure Estimation
3.1. Health	For the worker exposure assessment, see section 1 of Exposure Scenario 1, manufacture of toluene
3.2. Environment	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1. This is only applicable to the intermediate exposure scenario.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	For worker, see Exposure Scenario on manufacture of toluene
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 90.9% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Soil	
	Msafe: 4.56E+04g/day after RMM	
Substance Use	12 ktons/year	
Onsite risk management measures	93.3 % efficiency water treatment in STP, 80 % removal efficiency air emission	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.3	
Typical release to water after RMM	4.03E-01 mg/l	



4. Exposure scenario 4: Use of toluene in roads and construction - Professional

4.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in road and construction appliances of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13
	Environmental Release Categories: ERC 8Dand 8F
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.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
	0
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only, beyond REACH Chemical Safety Assessment and may be communicated in Section 5 of the ES or within the main sections of the SDS.
Drum/batch transfers [CS8]. ; Non-dedicated facility [CS82]	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. or if technical measures not practicable [G16] Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]



Drum/batch transfers [CS8]. ; Dedicated facility [CS81]	Ensure material transfers are under containment or extract ventilation [E66]. or if technical measures not practicable [G16] Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]
Manual roller application or brushing [CS13].	Ensure operation is undertaken outdoors [E69].
Spraying/fogging by machine application [CS25].	Ensure operation is undertaken outdoors [E69]. Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Dipping, immersion and pouring [CS4].	Ensure operation is undertaken outdoors [E69].
Equipment cleaning and maintenance [CS39].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].
Storage [CS67]	No specific measures identified [E18].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E18].

Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	30ktons	
	Regional tonnage	3ktons	
	Fraction of the main local source	2.00E-03	
Frequency and duration of use	Emission days per year	365	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 8.15.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.95	
	Release fraction to waste water from process before RMM	0.01	
	Release fraction to soil from process before RMM	0.04	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >%		
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]		
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]		



	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]
Conditions and measures related to external treatment of waste for disposal	ETW 3 : External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	ERW 1 : External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other environmental control measures additional to above	None
Basis for scaling	Environment
	Risk-driving Compartment – Freshwater
	Msafe: 5748 kg/day before RMM

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes	
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Basis for scaling	Environment
	Risk-driving Compartment – Freshwater
	Msafe: 7.85E+04kg/day after RMM
Site Use	0.06ktonnes/year
Onsite risk management measures	93.3 % efficiency water treatment in STP, 0 % removal efficiency air emission
Dilution factors	Freshwater
	10



	Marine water	100
Initial release percent at site to water (before RMM)		1
Typical release to water after RMM		1.97E-03 mg/l



5. Exposure scenario 5: Use of toluene in cleaning agents- Industrial

5.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in cleaning agents of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU10)
	Process Categories: PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13
	Environmental Release Categories: ERC4
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.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
Bulk transfers [CS14].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Automated process with (semi) closed systems [CS93]. Use in contained systems [CS38].	No specific measures identified [E118].



Automated process with (semi) closed systems [CS93] Use in contained systems [CS38]. ; Drum/batch transfers [CS8]. Use in contained systems [CS38].	No specific measures identified [E118].
Application of cleaning products in closed systems [CS101]	No specific measures identified [E118].
Filling / preparation of equipment from drums or containers. [CS45]. Dedicated facility [CS81]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. Provide a good standard or general ventilation (not less than 3-5 air changes per hour [E11] or , if technical measures not practicable [G16] Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]
Use in contained batch processes [CS37]. Treatment by heating [OC129]	Provide extract ventilation to points where emissions occur [E54].
Degreasing small objects in cleaning station [CS41].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Cleaning with low-pressure washers [CS42].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Cleaning with high pressure washers [CS44].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. Limit the substance content in the product to 5% [OC17]
Manual [CS34]. Surfaces [CS48]. Cleaning [CS47]. No spraying [CS60].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Equipment cleaning and maintenance [CS39].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	15ktons	
	Regional tonnage	1.5ktons	
	Fraction of the main local source	1	
Frequency and duration of use	Emission days per year	300	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 4.4a.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.3	



	Release fraction to waste water from process before RMM	0.00003
	Release fraction to soil from process before RMM	0
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR7: Treat air emissions to provide a typical removal efficiency of >70%.	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
	TCR 4: Soil emission controls are not applicable as there is no direct release to soil.	
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]	
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]	
Conditions and measures related to external treatment of waste for disposal	ETW 3: External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	ERW 3: External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Other environmental control measures additional to above	None	

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes

DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).



Basis for scaling	Environment	
	Risk-driving Compartment – Freshwater	
	Msafe: 1.77E+06kg/day after RMM	
Site Use	1.5 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 70 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.003	
Typical release to water after RMM	1.92E-03 mg/l	



6. Exposure scenario 6: Use of toluene in cleaning agents – Professional

6.1. Exposure scenario

Section 1	
Exposure Scenario Title	
Title	Use in cleaning agents of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13
	Environmental Release Categories: ERC 8A, ERC 8D
Processes, tasks, activities covered	Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping automated and by hand).
Section 2	
Operational conditions and risk management measures	
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	
Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	
Risk Management Measures Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.	
Filling / preparation of equipment from drums or containers. [CS45]. Dedicated facility [CS81]	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Automated process with (semi) closed systems [CS93] Use in contained systems [CS38].	No specific measures identified [E118].



Automated process with (semi) closed systems [CS93] Use in contained systems [CS38]. ; Drum/batch transfers [CS8].	No specific measures identified [E118].
Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products) [CS76]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Filling / preparation of equipment from drums or containers. [CS45]. Outdoor [OC9].	Ensure operation is undertaken outdoors [E69]. Avoid carrying out operation for more than 4 hours [OC12].
Manual [CS34]. Cleaning [CS47]. ; Surfaces [CS48]. ; Dipping, immersion and pouring [CS4].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Cleaning with low-pressure washers [CS42]. Rolling, Brushing [CS51]. ; No spraying [CS60].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Cleaning with high pressure washers [CS44]. Spraying [CS10]. Indoor [OC8].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Cleaning with high pressure washers [CS44]. Spraying [CS10]. Outdoor [OC9].	Ensure operation is undertaken outdoors [E69]. Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Manual [CS34]. Surfaces [CS48]. ; Cleaning [CS47]. ; Spraying [CS10].	Provide a good standard of general ventilation. Natural ventilation is from windows and doors etc. Controlled ventilation means air is supplied or removed by a powered fan. [E1]. Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Ad hoc manual application via trigger sprays, dipping, etc. [CS27]. Rolling, Brushing [CS51].	Provide extract ventilation to points where emissions occur [E54].
Ad hoc manual application via trigger sprays, dipping, etc. [CS27]. Rolling, Brushing [CS51].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].Wear a respirator conforming to EN140 with Type A filter or better. [PPE22].
Application of cleaning products in closed systems [CS101] Outdoor [OC9].	Ensure operation is undertaken outdoors [E69].
Cleaning of medical devices [CS74]	Provide extract ventilation to points where emissions occur [E54].
Equipment cleaning and maintenance [CS39].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2	Control of environmental exposure
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is



	readily biodegradable.	
Amounts used	EU tonnage	15ktons
	Regional tonnage	1.5ktons
	Fraction of the main local source	2.00E-03
Frequency and duration of use	Emission days per year	365
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Conditions given in SPERC fact sheet (ESVOC SpERC 8.4b.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.02
	Release fraction to waste water from process before RMM	0.000001
	Release fraction to soil from process before RMM	0
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >0%.	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
	TCR 4: Soil emission controls are not applicable as there is no direct release to soil.	
Organisation measures to prevent/limit release from site	OMS 2: 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 93.3 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 2000 (m ³ /d) [STP5]	
Conditions and measures related to external treatment of waste for disposal	ETW 3 : External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	ERW 1 : External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Other environmental control measures additional to above	None	

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.



Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Freshwater	
	Msafe: 3.895E+03kg/day after RMM	
Site Use	0.003 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.0001	
Typical release to water after RMM	1.44E-03 mg/l	



7. Exposure scenario 7: Use of toluene as a fuel – Industrial

7.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in Fuels of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU10)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16
	Environmental Release Categories: ERC7
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.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
Bulk transfers [CS14].	No specific measures identified [E118].
Drum/batch transfers [CS8].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
General exposures (closed systems) [CS15].	No specific measures identified [E118].



General exposures (closed systems) [CS15]. With occasional controlled exposure [CS137]	No specific measures identified [E118].
General exposures (closed systems) [CS15]. Batch process [CS55].	No specific measures identified [E118].
General exposures (open systems) [CS16]. ; (closed systems) [CS107]	No specific measures identified [E118].
General exposures (open systems) [CS16]. ; (closed systems) [CS107]. Batch process [CS55].	No specific measures identified [E118].
Equipment maintenance [CS5].	Drain down and flush system prior to equipment break-in or maintenance [E55].Wear suitable coveralls to prevent exposure to the skin [PPE27].
Vessel and container cleaning [CS103]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Storage [CS67]	No specific measures identified [E118].

Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	150ktonnes	
	Regional tonnage	15ktonnes	
	Fraction of the main local source	1	
Frequency and duration of use	Emission days per year	300	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 7.12a.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.0025	
	Release fraction to waste water from process before RMM	0.00001	
	Release fraction to soil from process before RMM	0	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >95%.		
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]		
	TCR 4: Soil emission controls are not applicable as there is no direct release to soil.		



Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]
Conditions and measures related to external treatment of waste for disposal	ETW 5: This substance is consumed during use and no waste of the substance is generated.
Conditions and measures related to external recovery of waste	ERW 3: This substance is consumed during use and no waste of the substance is generated.
Other environmental control measures additional to above	None

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1 .
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes	
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Basis for scaling	Environment
	Risk-driving Compartment – Freshwater
	Msafe: 1.11E+07kg/day after RMM
Site Use	15 ktons/year
Onsite risk management measures	93.3 % efficiency water, 95 % efficiency air
Dilution factors	Freshwater
	10



	Marine water	100
Initial release percent at site to water (before RMM)		0.001
Typical release to water after RMM		3.06E-03 mg/l



8. Exposure scenario 8: Use of toluene as a fuel – Professional

8.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in Fuels of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16
	Environmental Release Categories: ERC 9A, ERC 9B
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.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
Bulk transfers [CS14].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Drum/batch transfers [CS8].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Dipping, immersion and pouring [CS4].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].



General exposures (closed systems) [CS15].	No specific measures identified [E118].
General exposures (closed systems) [CS15]. With occasional controlled exposure [CS137]	No specific measures identified [E118].
General exposures (open systems) [CS16]. (closed systems) [CS107]. Batch process [CS55].	No specific measures identified [E118].
General exposures (open systems) [CS16]. (closed systems) [CS107]	Handle substance within a closed system [E47]. No other specific measures identified [E120].
Equipment cleaning and maintenance [CS39].	Drain down and flush system prior to equipment break-in or maintenance [E55].
Vessel and container cleaning [CS103]	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67]	Store substance within a closed system [E84].

Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	150ktons	
	Regional tonnage	15ktons	
	Fraction of the main local source	2.00E-03	
Frequency and duration of use	Emission days per year	365	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 9.12b.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.001	
	Release fraction to waste water from process before RMM	0.00001	
	Release fraction to soil from process before RMM	0.00001	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >0%.		
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]		
Organisation measures to prevent/limit release from site	OMS 2: 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 93.3 (%) [STP3]		



	Assumed domestic sewage treatment plant flow 2000 (m ³ /d) [STP5]
Conditions and measures related to external treatment of waste for disposal	ETW 5: This substance is consumed during use and no waste of the substance is generated.
Conditions and measures related to external recovery of waste	ERW 3: This substance is consumed during use and no waste of the substance is generated.
Other environmental control measures additional to above	None

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Freshwater	
	Msafe: 3.895E+03kg/day after RMM	
Site Use	0.03 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.001	



Typical release to water after RMM

1.44E-03 mg/l



9. Exposure scenario 9: Use of toluene as a fuel – Consumer

9.1. Exposure scenario

Section 1		Exposure Scenario Title
Title		Fuels
Sector of Use (SU code)		21
Use Descriptor (PC codes)		PC13
Processes, tasks, activities covered		Covers consumer uses in liquid fuels
Environmental Release Category		ERC 9A and 9B
Section 2		Operational conditions and risk management measures
Field for additional statements to explain scenario if required - pending better understanding from ECHA.		
Section 2.1		Control of consumer exposure
Product characteristics		
Physical form of product		liquid
Vapour pressure		3089
Concentration of substance in product		Unless otherwise stated, cover concentrations up to 100% [ConsOC1]
Amounts used		Unless otherwise stated, covers use amounts up to 37500g [ConsOC2]; covers skin contact area up to 420cm ² [ConsOC5]
Frequency and duration of use/exposure		Unless otherwise stated, covers use frequency up to 0.143 times per day [ConsOC4]; covers exposure up to 2 hours per event [ConsOC14]
Other Operational Conditions affecting exposure		Unless otherwise stated assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m ³ room [ConsOC11]; assumes use with typical ventilation [ConsOC8].
Section 2.1.1		Product categories
PC13:Fuels--Liquid - subcategories added: Automotive Refuelling	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm ² [ConsOC5]; for each use event, covers use amounts up to 37500g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m ³ [ConsOC11]; for each use event, covers exposure up to 0.05hr/event[ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated
Liquid - subcategories added: Automotive Refuelling--Tier 2: inhalation measured data and Tier 2 dermal	OC	
	RMM	



PC13:Fuels--Liquid - subcategories added: Scooter Refuelling	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 3750g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m3[ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated
Liquid - subcategories added: Scooter Refuelling--Tier 2: inhalation measured data and Tier 2 dermal: used same as vehicle refueling	OC	
	RMM	
PC13:Fuels--Liquid - subcategories added: Garden Equipment - Use	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 26 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 750g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated
Liquid - subcategories added: Garden Equipment - Use-- Tier 2: inhalation measured data	OC	
	RMM	
PC13:Fuels--Liquid (subcategories added): Garden Equipment - Refueling	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 26 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 420.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 750g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated
Liquid (subcategories added): Garden Equipment - Refueling--Tier 2: inhalation measured data and dermal modeled	OC	
	RMM	
PC13:Fuels--Liquid - subcategories added: Lamp oil	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 100g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.01hr/event[ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated

Section 2.2



Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1	
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.	
Amounts Used	EU tonnage	150 ktons/year
	Regional tonnage	15 ktons/year
	Fraction of main local source	2.00E-03
Frequency and duration of use	Emission days per year	365
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	0.001
	Release fraction to waste water from process	0.00001
	Release fraction to soil from process (regional only)	0.00001
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emissions to provide a typical removal efficiency of >0%. [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
	Soil emission controls are not applicable as there is no direct release to soil. [TCR 4]	
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils [OMS2].	
	Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment 93.3 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 20000 (m ³ /d) [STP5]	
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. [ETW 3]	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.[ERW 1]	
Other environmental control measures additional to above	None	

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) when available and operational conditions (OCs) are observed, exposure of consumers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.



3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Freshwater	
	Msafe: 3.895E+03kg/day after RMM	
Substance Use	0.03 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.001	
Typical release to water after RMM	1.44E-03 mg/l	



10. Exposure scenario 10: Use of toluene in coatings - Industrial

10.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in coatings of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU10)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC 9, PROC10, PROC13, PROC15
	Environmental Release Categories: ERC 4
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.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
General exposures (closed systems) [CS15].	No specific measures identified [E118].
General exposures (closed systems) [CS15]. With sample collection [CS56]. ; Use in contained systems [CS38].	No specific measures identified [E118].



Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing [CS94]	No specific measures identified [E118].
Mixing operations (closed systems) [CS29]. General exposures (closed systems) [CS15].	No specific measures identified [E118].
Film formation - air drying [CS95]	No specific measures identified [E118].
Preparation of material for application [CS96] Mixing operations (open systems) [CS30].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Spraying (automatic/robotic) [CS97]	Carry out in a vented booth or extracted enclosure [E57].
Manual [CS34]. Spraying [CS10].	Carry out in a vented booth or extracted enclosure [E57]. Or Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Material transfers [CS3]. Non-dedicated facility [CS82]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Material transfers [CS3]. Dedicated facility [CS81]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Roller, spreader, flow application [CS98]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Dipping, immersion and pouring [CS4].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Laboratory activities [CS36].	No specific measures identified [E118].
Material transfers [CS3]. Drum/batch transfers [CS8]. ; Transfer from/pouring from containers [CS22].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Production or preparation of articles by tableting, compression, extrusion or pelletisation [CS100]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Equipment cleaning and maintenance [CS39].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	45ktoes	
	Regional tonnage	4.5ktons	



	Fraction of the main local source	1
Frequency and duration of use	Emission days per year	300
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Conditions given in SPERC fact sheet (ESVOC SpERC 4.3a.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.98
	Release fraction to waste water from process before RMM	0.007
	Release fraction to soil from process before RMM	0
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >90%.	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
	TCR 4: Soil emission controls are not applicable as there is no direct release to soil.	
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]	
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]	
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and / or national regulations.	
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Other environmental control measures additional to above	None	

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency..



4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Soil	
	Msafe: 1.99E+04kg/day after RMM	
Site Use	4.5 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 90 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.7	
Typical release to water after RMM	3.44E-01 mg/l	



11. Exposure scenario 11: Use of toluene in coatings – Professional

11.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in coatings of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19
	Environmental Release Categories: ERC 8A, ERC 8D
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, brush, spreader by hand or similar methods, and film formation), and equipment cleaning, maintenance and associated laboratory activities.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
General exposures (closed systems) [CS15].	No specific measures identified [E18].
Filling / preparation of equipment from drums or containers. [CS45].	No specific measures identified [E18].



General exposures (closed systems) [CS15]. Use in contained systems [CS38].	No specific measures identified [E118].
Preparation of material for application [CS96]	No specific measures identified [E118].
Film formation - air drying [CS95] Outdoor [OC9].	Ensure operation is undertaken outdoors [E69].
Film formation - air drying [CS95] Indoor [OC8].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Preparation of material for application [CS96] Indoor [OC8].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Preparation of material for application [CS96]	Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 4 hours [OC28]
Material transfers [CS3]. Drum/batch transfers [CS8].	Use drum pumps or carefully pour from container [E64].
Material transfers [CS3]. Drum/batch transfers [CS8].	Use drum pumps or carefully pour from container [E64]. Use container to collect drips [E73].
Roller, spreader, flow application [CS98] Indoor [OC8].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Roller, spreader, flow application [CS98] Outdoor [OC9].	Ensure operation is undertaken outdoors [E69]. Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Manual [CS34]. Spraying [CS10]. ; Indoor [OC8].	Carry out in a vented booth or extracted enclosure [E57].
Manual [CS34]. Spraying [CS10]. ; Outdoor [OC9].	Ensure operation is undertaken outdoors [E69]. Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Dipping, immersion and pouring [CS4]. Indoor [OC8].	Provide extract ventilation to points where emissions occur [E54].
Dipping, immersion and pouring [CS4]. Outdoor [OC9].	Ensure operation is undertaken outdoors [E69]. Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely. [PPE21]
Laboratory activities [CS36].	No specific measures identified [E118].
Hand application - fingerpaints, pastels, adhesives [CS72] Indoor [OC8].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. Ensure doors and windows are opened [E72].
Hand application - fingerpaints, pastels, adhesives [CS72] Outdoor [OC9].	Ensure operation is undertaken outdoors [E69]. Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely. [PPE21]
Equipment cleaning and maintenance [CS39].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].



Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	150ktonnes	
	Regional tonnage	15ktonnes	
	Fraction of the main local source	2.00E-03	
Frequency and duration of use	Emission days per year	365	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 8.3b.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.98	
	Release fraction to waste water from process before RMM	0.01	
	Release fraction to soil from process before RMM	0.01	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >0%.		
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]		
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]		
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]		
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and / or national regulations.		
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.		
Other environmental control measures additional to above	None		

Section 3		Exposure Estimation	
3.1. Health		When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and of indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.	
3.2. Environment		When the recommended risk management measures (RMMs) and	



	operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Soil	
	Msafe: 1.27E+04kg/day after RMM	
Substance Use	0.03 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	1	
Typical release to water after RMM	4.11E-03 mg/l	



12 Exposure assessment12: Use of toluene in coatings – Consumer

In the absence of experimental animal data or human case reports indicating a potential to cause local toxicity, a reference value for local effects was developed based on results of skin irritation testing; this showed erythema (redness) persisting for longer than 24 hr following dermal application of 0.5 ml liquid (433 mg) to 6 cm² of rabbit skin (conditions assumed identical to those of EU guideline B4). In view of the response obtained, it is not unreasonable to predict that no irritation would occur after application of one third of the guideline amount (144 mg). This is equivalent to local dermal reference dose of 24 mg/cm².

The inhalation long-term systemic DNEL for the general population is based upon the internal dose received by a worker engaged in light activity (respiratory volume 0.144 m³/kg body weight) and exposed to the IOELV (192 mg/m³) for 8 hours, modified after accounting for intra-species differences assumed inherent in the two populations (assessment factor = 1.7). The resultant internal dose is 16.3 mg/kg bwt/day.

12.1. Exposure scenario

Section 1		Exposure Scenario Title
Title		Uses in Coatings
Sector of Use (SU code)		21
Use Descriptor (PC codes)		PC1, PC4, PC8 (excipient only), PC9, PC15, PC18, PC23, PC24, PC31, PC34 (PC5,PC10)
Processes, tasks, activities covered		Covers the use in coatings (paints, inks, adhesives, etc) including exposure during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.
Environmental Release Category		ERC9A and 9B
Specific Environmental Release Category		
Section 2		Operational conditions and risk management measures
Field for additional statements to explain scenario if required - pending better understanding from ECHA.		
Section 2.1		Control of consumer exposure
Product characteristics		
Physical form of product		liquid
Vapour pressure		3089
Concentration of substance in product		Unless otherwise stated, cover concentrations up to 100% [ConsOC1]
Amounts used		Unless otherwise stated, covers use amounts up to 13800g [ConsOC2]; covers skin contact area up to 857.5cm ² [ConsOC5]
Frequency and duration of use/exposure		Unless otherwise stated, covers use frequency up to 1 times per day [ConsOC4]; covers exposure up to 6 hours per event [ConsOC14]
Other Operational Conditions affecting exposure		Unless otherwise stated assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m ³ room [ConsOC11]; assumes use with typical ventilation [ConsOC8].
Section 2.1.1		Product categories



PC4_n:Anti-freeze and de-icing products--Washing car window	OC	Unless otherwise stated, covers concentrations up to 1% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 0.5g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.02hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Pouring into radiator	OC	Unless otherwise stated, covers concentrations up to 10% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 2000g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Lock de-icer	OC	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 214.40 cm2 [ConsOC5]; for each use event, covers use amounts up to 4g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.25hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)-- Laundry and dish washing products	OC	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 15g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.50hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)-- Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	OC	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 27g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)-- Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	OC	Unless otherwise stated, covers concentrations up to 15% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 35g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated



PC9a:Coatings and paints, fillers putties, thinners--Waterborne latex wall paint	OC	Unless otherwise stated, covers concentrations up to 0.8% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm ² [ConsOC5]; for each use event, covers use amounts up to 2760g [ConsOC2]; covers use in room size of 20m ³ [ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners--Solvent rich, high solid, water borne paint	OC	Unless otherwise stated, covers concentrations up to 2.5% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm ² [ConsOC5]; for each use event, covers use amounts up to 744g [ConsOC2]; covers use in room size of 20m ³ [ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners--Removers (paint-, glue-, wall paper-, sealant-remover)	OC	Unless otherwise stated, covers concentrations up to 4% [ConsOC1]; covers use up to 3 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm ² [ConsOC5]; for each use event, covers use amounts up to 491g [ConsOC2]; covers use in room size of 20m ³ [ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay--Fillers and putty	OC	Unless otherwise stated, covers concentrations up to 2% [ConsOC1]; covers use up to 12 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.73 cm ² [ConsOC5]; for each use event, covers use amounts up to 85g [ConsOC2]; covers use in room size of 20m ³ [ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay--Plasters and floor equalizers	OC	Unless otherwise stated, covers concentrations up to 0.1% [ConsOC1]; covers use up to 12 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm ² [ConsOC5]; for each use event, covers use amounts up to 13800g [ConsOC2]; covers use in room size of 20m ³ [ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay--Modelling clay	OC	Unless otherwise stated, covers concentrations up to 1% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 254.40 cm ² [ConsOC5]; for each use event, assumes swallowed amount of 1g [ConsOC13]; covers use in room size of 20m ³ [ConsOC11]; for each use event, covers exposure up to 1.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC9c:Finger paints --Finger paints	OC	Unless otherwise stated, covers concentrations up to 0.1% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 254.40 cm ² [ConsOC5]; for each use event, assumes swallowed amount of 1.35g [ConsOC13]; covers use in room size of 20m ³ [ConsOC11]; for each use event, covers exposure up to 1.00hr/event[ConsOC14];



	RMM	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products--Waterborne latex wall paint	OC	Unless otherwise stated, covers concentrations up to 0.28% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 2760g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products--Solvent rich, high solid, water borne paint	OC	Unless otherwise stated, covers concentrations up to 1% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 744g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products--Aerosol spray can	OC	Unless otherwise stated, covers concentrations up to 4.5% [ConsOC1]; covers use up to 2 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 215g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products--Removers (paint-, glue-, wall paper-, sealant-remover)	OC	Unless otherwise stated, covers concentrations up to 1.5% [ConsOC1]; covers use up to 3 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 491g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC18_n: Ink and toners--Inks and toners.	OC	Unless otherwise stated, covers concentrations up to 10% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 71.40 cm2 [ConsOC5]; for each use event, covers use amounts up to 40g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC23_n: Leather tanning, dye, finishing, impregnation and care products--Polishes, wax / cream (floor, furniture, shoes)	OC	Unless otherwise stated, covers concentrations up to 11% [ConsOC1]; covers use up to 29 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 56g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 1.23hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated



PC23_n: Leather tanning, dye, finishing, impregnation and care products--Polishes, spray (furniture, shoes)	OC	Unless otherwise stated, covers concentrations up to 8% [ConsOC1]; covers use up to 8 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 56g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Liquids	OC	Unless otherwise stated, covers concentrations up to 35% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 468.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 2200g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Pastes	OC	Unless otherwise stated, covers concentrations up to 20% [ConsOC1]; covers use up to 10 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 468.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 34g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11];
	RMM	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Sprays	OC	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 73g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC31:Polishes and wax blends--Polishes, wax / cream (floor, furniture, shoes)	OC	Unless otherwise stated, covers concentrations up to 4.5% [ConsOC1]; covers use up to 29 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 142g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 1.23hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC31:Polishes and wax blends--Polishes, spray (furniture, shoes)	OC	Unless otherwise stated, covers concentrations up to 14% [ConsOC1]; covers use up to 8 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 35g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC34_n: Textile dyes, finishing and impregnating products--	OC	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 115g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 1.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated



Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	150 ktons	
	Regional tonnage	15 ktons	
	Fraction of the main local source	2.00E-03	
Frequency and duration of use	Emission days per year	365	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 8.3c.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from wide dispersive use (regional only)	0.985	
	Release fraction to wastewater from wide dispersive use (regional only)	0.01	
	Release fraction to soil from wide dispersive use (regional only)	0.005	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater [TCR1a]		
	Treat air emission to provide a typical removal efficiency of 0% [TCR 7]		
Organisation measures to prevent/limit release from site	Prevent environmental discharge consistent with regulatory requirements. [OMS4]		
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment is 93.3 (%) [STP3]		
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]		
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 [ETW3].		
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]		
Other environmental control measures additional to above	None		

Section 3		Exposure Estimation ('Flexible' heading)
ECHA Note in draft template: Exposure estimation and risk characterisation ratios (for all routes of exposure for consumers and all compartments for environment) resulting from the conditions described under Sections 2.1 and 2.2.), and the substance properties; make reference to the exposure assessment tool applied. Note: Detail could be confusing for customers. Also may be an extensive list. Proposal to include a weblink from where these data can be retrieved (a component of GES development).		
3.1. Health		



		When the recommended risk management measures (RMMs) when available and operational 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.
3.2. Environment		
		When the recommended risk management measures (RMMs) and operational 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.
Section 4		Guidance to check compliance with the Exposure Scenario ('Flexible' heading)
Guidance how the DU can evaluate whether he operates within the conditions set in the exposure scenario - scaling tools. Standard phrases		
4.1. Health		
		Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment		
		Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Freshwater	
	Msafe: 1.36E+04kg/day after RMM	
Site Use	0.03 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	1	
Typical release to water after RMM	4.11E-03 mg/l	



13 Exposure assessment 13: Use of toluene in oilfield drilling and production operations – Industrial

13.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in oil field drilling and production operations of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU10)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b
	Environmental Release Categories: ERC4
Processes, tasks, activities covered	Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient , unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
Bulk transfers [CS14].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. or Operate activity away from sources of emissions or release [E77], alternatively, if technical measures not practicable [G16] Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]
Filling / preparation of equipment from drums or containers. [CS45].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].



Drill floor operations [CS116].	No specific measures identified [E118].
Drill floor operations [CS116].	Ensure operation is undertaken outdoors [E69].
Operation of solids filtering equipment - vapour exposures [CS118].	Ensure material transfers are under containment or extract ventilation [E66].
Operation of solids filtering equipment - aerosol exposures [CS119].	Ensure material transfers are under containment or extract ventilation [E66].
Operation of solids filtering equipment [CS117].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Treatment and disposal of filtered solids [CS121].	No specific measures identified [E118].
Process sampling [CS2].	No specific measures identified [E118].
General exposures (closed systems) [CS15].	No specific measures identified [E118].
Pouring from small containers [CS9].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].Wear suitable gloves tested to EN374 [PPE15].
General exposures (open systems) [CS16].	Ensure operation is undertaken outdoors [E69].
Equipment cleaning and maintenance [CS39].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].Wear suitable gloves tested to EN374 [PPE15].
Batch process [CS55].	No specific measures identified [E118].
Batch process [CS55]. With occasional controlled exposure [CS137]	Provide extract ventilation to points where emissions occur [E54].

Section 2.2		Control of environmental exposure	
Assessment method	Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment. Qualitative approach used to conclude safe use.		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	30ktons	
	Regional tonnage	3ktons	
	Fraction of the main local source	1	
Frequency and duration of use	Emission days per year	N/A	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	N/A	
	Local marine water dilution factor	N/A	
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	N/A	
	Release fraction to water from process before RMM	N/A	
	Release fraction to soil from process before RMM	N/A	



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)
Organisation measures to prevent/limit release from site	Prevent environmental discharge consistent with regulatory requirements.
Conditions and measures related to municipal sewage treatment plant	N/A
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other environmental control measures additional to above	N/A

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational 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
3.2. Environment	Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment. Qualitative approach used to conclude safe use.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Discharge to aquatic environment is restricted by law and industry prohibits release. ¹ OSPAR Commission 2009. Discharges, Spills and Emissions from Offshore Oil and Gas Installations in 2007, including the assessment of data reported in 2006 and 2007.

Values for Scaling Purposes	
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Basis for scaling	Environment
	#N/A
Site Use	3 ktons/year



Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	#N/A
	Marine water	#N/A
Initial release percent at site to water (before RMM)	#N/A	
Typical release to water after RMM	#N/A	



14 Exposure assessment 14: Use of toluene in binders and release agents – Industrial

14.1. Exposure scenario

Section 1		Exposure Scenario Title
Title	Use in binders and release agents of Toluene; CAS RN108-88-3	
Use Descriptor	Sector of Use: Industrial (SU3, SU8, SU9)	
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14	
	Environmental Release Categories: ERC5	
Processes, tasks, activities covered	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting, and handling of waste.	
Section 2		Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.	
Section 2.1		Control of worker exposure
Product characteristics		
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].	
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].	
Amounts used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]	
Human factors not influenced by risk management	Not applicable	
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient , unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]	
	0	
Contributing Scenarios		Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.	
Material transfers [CS3].	No specific measures identified [E18].	
Material transfers [CS3]. With occasional controlled exposure [CS137]	No specific measures identified [E18].	



Material transfers [CS3]. Batch process [CS55]. ; (closed systems) [CS107].	No specific measures identified [E118].
Drum/batch transfers [CS8].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Mixing operations (closed systems) [CS29].	No specific measures identified [E118].
Mixing operations (open systems) [CS30].	No specific measures identified [E118].
Mold forming [CS31].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Casting operations [CS32].	Provide extract ventilation to points where emissions occur [E54].
Spraying [CS10]. Machine [CS33].	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60].
Manual roller application or brushing [CS13].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Storage [CS67]. With occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2	Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1	
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.	
Amounts used	EU tonnage	15ktons
	Regional tonnage	1.5ktons
	Fraction of the main local source	1
Frequency and duration of use	Emission days per year	300
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Conditions given in SPERC fact sheet (ESVOC SpERC 4.10a.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.2
	Release fraction to waste water from process before RMM	0.00003
	Release fraction to soil from process before RMM	0
Technical onsite conditions and measures to reduce or limit discharges, air emissions and	TCR 7: Treat air emissions to provide a typical removal efficiency of >80%.	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	



releases to soil	TCR 4: Soil emission controls are not applicable as there is no direct release to soil.
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other environmental control measures additional to above	None

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes	
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Basis for scaling	Environment
	Risk-driving Compartment – Soil
	Msafe: 7.44E+05kg/day after RMM
Substance Use	1.5 ktonnes/year
Onsite risk manageme	93.3 % efficiency water, 80 % efficiency air



nt measures		
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.003	
Typical release to water after RMM	1.92E-03 mg/l	



15 Exposure assessment 15: Use of toluene in binders and release agents – Professional

15.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use as mould release and binder of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC6, PROC 8a, PROC8b, PROC10, PROC11, PROC14
	Environmental Release Categories: ERC 8 series (A, B, C, D, E, F)
Processes, tasks, activities covered	Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
Material transfers [CS3]. ; (closed systems) [CS107]	No specific measures identified [E118].
Material transfers [CS3]. ; (closed systems) [CS107]With occasional controlled exposure [CS137]	No specific measures identified [E118].



Material transfers [CS3]. ; (closed systems) [CS107] Batch process [CS55].	No specific measures identified [E118].
Drum/batch transfers [CS8].	Transfer materials directly to mixing vessels [E45].
Mixing operations (closed systems) [CS29].	No specific measures identified [E118].
Mixing operations (open systems) [CS30].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Mold forming [CS31].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Casting operations [CS32]. ; (open systems) [CS108]	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Spraying [CS10]. ; Manual [CS34].	Carry out in a vented booth or extracted enclosure [E57]. ; Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Manual roller application or brushing [CS13].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Spraying [CS10]. ; Manual [CS34].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Storage [CS67]	No specific measures identified [E118].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	15ktons/year	
	Regional tonnage	1.5ktons/year	
	Fraction of the main local source	2.00E-03	
Frequency and duration of use	Emission days per year	365	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 8.10b.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.95	
	Release fraction to waste water from process before RMM	0.025	
	Release fraction to soil from process before RMM	0.025	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and	TCR 7: Treat air emissions to provide a typical removal efficiency of >0%.		
	Typical onsite wastewater treatment technology provides removal efficiency		



releases to soil	of 93.3%. [TCR 11]
Organisation measures to prevent/limit release from site	Not applicable
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment is 93.3 (%) [STP3]
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other environmental control measures additional to above	None

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes	
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Basis for scaling	Environment
	Risk-driving Compartment – Freshwater
	Msafe: 2.66E+03 kg/day after RMM
Substance Use	0.003 ktons/year



Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	2.5	
Typical release to water after RMM	2.10E-03 mg/l	



16 Exposure assessment16: Use of toluene as a laboratory reagent – Industrial

16.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in laboratory reagents of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU10)
	Process Categories: PROC10, PROC15
	Environmental Release Categories: ERC 2, 4
Processes, tasks, activities covered	Use of the substance within laboratory settings, including material transfers and equipment cleaning
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20 °C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only,.
Laboratory activities [CS36]. Small scale [CS61]. Handling small quantities (<1000ml) for more than 4 hours/day - inside fume cupboard.	No specific measures identified [E18].
Cleaning [CS47]. Rolling, Brushing [CS51]. Vessel and container cleaning [CS103] Cleaning equipment, glassware etc under general ventilation for 15 min - 1 hour/day	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].



Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	15ktons/year	
	Regional tonnage	1.5ktons/year	
	Fraction of the main local source	1	
Frequency and duration of use	Emission days per year	300	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Releases based on ERC 2 defaults			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.025	
	Release fraction to waste water from process before RMM	0.02	
	Release fraction to soil from process before RMM	0.0001	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >0%.		
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]		
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]		
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]		
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.		
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.		
Other environmental control measures additional to above	None		

Section 3		Exposure Estimation	
3.1. Health			
		When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.	
3.2. Environment			
		When the recommended risk management measures (RMMs) and	



	operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency..
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Soil	
	Msafe: 7.02E+03kg/day after RMM	
Substance Use	1.5 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	2	
Typical release to water after RMM	3.27E-01 mg/l	



17 Exposure assessment 17: Use of toluene as a laboratory reagent – Professional

17.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in laboratory reagents of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC10, PROC15
	Environmental Release Categories: ERC 4
Processes, tasks, activities covered	Use of the substance within laboratory settings, including material transfers and equipment cleaning
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20 °C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Risk Management Measures Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only,.
Laboratory activities [CS36]. Small scale [CS61]. Handling small quantities (<1000ml) for more than 4 hours/day - inside fume cupboard.	No specific measures identified [EI18].
Cleaning [CS47]. Rolling, Brushing [CS51]. ; Vessel and container cleaning [CS103]Cleaning equipment, glassware etc under general ventilation for 15 min - 1 hour/day	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].



Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	15ktons/year	
	Regional tonnage	1.5ktons/year	
	Fraction of the main local source	2.00E-03	
Frequency and duration of use	Emission days per year	365	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 8.17.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.5	
	Release fraction to waste water from process before RMM	0.5	
	Release fraction to soil from process before RMM	0	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >0%.		
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]		
	TCR 4: Soil emission controls are not applicable as there is no direct release to soil.		
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]		
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]		
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.		
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.		
Other environmental control measures additional to above	None		

Section 3		Exposure Estimation	
3.1. Health		When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.	



3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Soil	
	Msafe: 2.8E+02kg/day after RMM	
Substance Use	0.003 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	50	
Typical release to water after RMM	1.48E-02 mg/l	



18 Exposure assessment 18: Use of toluene in functional fluids – Industrial

18.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in functional fluids of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU8, SU9)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC 8a, PROC 8b, PROC9
	Environmental Release Categories: ERC7
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.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only,.
Bulk transfers [CS14].	No specific measures identified [E18].
Bulk transfers [CS14]. With occasional controlled exposure [CS137]	No specific measures identified [E18].
Bulk transfers [CS14]. Batch process [CS55].	No specific measures identified [E18].
Bulk transfers [CS14].	No specific measures identified [E18].



Drum/batch transfers [CS8]. Dedicated facility [CS81].	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60].
Pelletizing [CS53]. (closed systems) [CS107]	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60].
Filling / preparation of equipment from drums or containers. [CS45].	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60].
General exposures (closed systems) [CS15].	No specific measures identified [E118].
General exposures (open systems) [CS16].	No specific measures identified [E118].
General exposures (open systems) [CS16].	No specific measures identified [E118].
Remanufacture of reject articles [CS19].	Drain down system prior to equipment break-in or maintenance [E65].
Equipment maintenance [CS5].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67]	No specific measures identified [E118].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	15ktons/year	
	Regional tonnage	1.5ktons/year	
	Fraction of the main local source	1	
Frequency and duration of use	Emission days per year	300	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 7.13a.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.01	
	Release fraction to waste water from process before RMM	0.0003	
	Release fraction to soil from process before RMM	0.001	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >0%.		
	Typical onsite wastewater treatment technology provides removal		



	efficiency of 93.3%. [TCR 11]
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other environmental control measures additional to above	None

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes	
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Basis for scaling	Environment
	Risk-driving Compartment – Soil
	Msafe: 4.55E+05kg/day after RMM
Substance Use	1.5 ktons/year
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air



Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)		0.03
Typical release to water after RMM		6.32E-03 mg/l



19 Exposure assessment 19: Use of toluene in functional fluids – Professional

19.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in functional fluids of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC3, PROC 8a, PROC9, PROC20
	Environmental Release Categories: ERC 9A, ERC 9B
Processes, tasks, activities covered	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only,.
Drum/batch transfers [CS8]. Non-dedicated facility [CS82].	Use drum pumps or carefully pour from container [E64].
Transfer from/pouring from containers [CS22].	Use drum pumps or carefully pour from container [E64].
Filling / preparation of equipment from drums or containers. [CS45].	Use drum pumps or carefully pour from container [E64].
General exposures (closed systems) [CS15].	No specific measures identified [E18].
General exposures (open systems) [CS16]. At elevated temperature (product at 80oC)	Handle substance within a predominantly closed system provided with extract ventilation [E49].



Remanufacture of reject articles [CS19].	Drain down system prior to equipment break-in or maintenance [E65].
Equipment maintenance [CS5]. Non-dedicated facility [CS82].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	15ktons/year	
	Regional tonnage	1.5ktons/year	
	Fraction of the main local source	2.00E-03	
Frequency and duration of use	Emission days per year	365	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 9.13b.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.05	
	Release fraction to waste water from process before RMM	0.025	
	Release fraction to soil from process before RMM	0.025	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >0%.		
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]		
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]		
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]		
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.		
Conditions and measures related to external recovery of waste	EEW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.		
Other environmental control measures additional to above	None		

Section 3	Exposure Estimation
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3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Freshwater	
	Msafe: 2.66E+03kg/day after RMM	
Substance Use	0.003 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	2.5	
Typical release to water after RMM	2.10E-03 mg/l	



20 Exposure assessment 20: Use of toluene in rubber production and processing – Industrial

20.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in rubber manufacturing and processing of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU8, SU9)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC 5, PROC ^, PROC 7, PROC8a, PROC8b, PROC 13, PROC 14, PROC15, PROC 21
	Environmental Release Categories: ERC 4 and 6D
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.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
	0
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
Material transfers [CS3]. With occasional controlled exposure [CS137]	No specific measures identified [E118].
Material transfers [CS3]. Dedicated facility [CS81].	Provide a good standar of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Bulk weighing [CS91]	No specific measures identified [E118].



Bulk weighing [CS91]With occasional controlled exposure [CS137]	No specific measures identified [E118].
Small scale weighing [CS90]	Provide a good standar of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Additive premixing [CS92]	
Material transfers [CS3]. Dedicated facility [CS81].	Provide a good standar of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Material transfers [CS3].	Provide a good standar of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Additive premixing [CS92]Batch process [CS55].	Provide a good standar of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Calendering (including Banburys) [CS64]	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60].
Pressing uncured rubber blanks [CS73]	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Vulcanisation [CS70]	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Cooling cured articles [CS71]	Provide a good standar of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Laboratory activities [CS36].	No specific measures identified [E118].
Equipment maintenance [CS5].	Drain or remove substance from equipment prior to break-in or maintenance [E81].

Section 2.2		Control of environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1		
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.		
Amounts used	EU tonnage	60ktons/year	
	Regional Tonnage	6ktons/year	
	Fraction of the main local source	1	
Frequency and duration of use	Emission days per year	300	
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10	
	Local marine water dilution factor	100	
Conditions given in SPERC fact sheet (ESVOC SpERC 4.19.v1) give rise to following releases fractions			
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMM	0.01	



	Release fraction to waste water from process before RMM	0.003
	Release fraction to soil from process before RMM	0.0001
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >0%.	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]	
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]	
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Other environmental control measures additional to above	None	

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes

DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet
(<http://cefic.org/en/reach-for-industries-libraries.html>).



Basis for scaling	Environment	
	Risk-driving Compartment – Soil	
	Msafe 4.67E+05kg/day after RMM	
Substance Use	60 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.3	
Typical release to water after RMM	1.97E-01 mg/l	



21 Exposure assessment 21: Formulation of toluene

21.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Formulation of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU10)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15
	Environmental Release Categories: ERC2
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
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38]
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
General exposures (closed systems) [CS15].	No specific measures identified [E118].
General exposures (closed systems) [CS15]. With sample collection [CS56]. With occasional controlled exposure [CS137]	No specific measures identified [E118].



General exposures (closed systems) [CS15]. Use in contained batch processes [CS37].	No specific measures identified [E118].
General exposures (open systems) [CS16]. Batch process [CS55]. With sample collection [CS56]. With potential for aerosol generation [CS138].	No specific measures identified [E118].
Batch processes at elevated temperatures [CS136].	Ensure material transfers are under containment or extract ventilation [E66]. Provide extract ventilation to points where emissions occur [E54].
Process sampling [CS2].	No specific measures identified [E118].
Laboratory activities [CS36].	No specific measures identified [E118].
Bulk transfers [CS14].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11] or Operate activity away from sources of emissions or release [E77], alternatively, if technical measures not practicable [G16] Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (Type EN374) if regular skin contact likely [PPE21]
Mixing operations (open systems) [CS30]. With potential for aerosol generation [CS138].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Manual [CS34]. Transfer from/pouring from containers [CS22].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Drum/batch transfers [CS8].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Production or preparation of articles by tableting, compression, extrusion or pelletisation [CS100]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Drum and small package filling [CS6].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Equipment cleaning and maintenance [CS39].	Drain down and flush system prior to equipment break-in or maintenance [E55].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2	Control of environmental exposure
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Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1	
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.	
Amounts used	EU tonnage	150ktons/year
	Regional tonnage	15ktons/year
	Fraction of the main local source	1
Frequency and duration of use	Emission days per year	300
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Conditions given in SPERC fact sheet (ESVOC SpERC 2.2.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	0.025
	Release fraction to waste water from process before RMM	0.002
	Release fraction to soil from process before RMM	0.0001
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	TCR 7: Treat air emissions to provide a typical removal efficiency of >0%.	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]	
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]	
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Other environmental control measures additional to above	None	

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.



Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Soil	
	Msafe: 6.78E+04kg/day after RMM	
Site Use	15 ktons/year	
Onsite risk management measures	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.2	
Typical release to water after RMM	3.36E-01 mg/l	



22. Exposure assessment 22: Use of toluene in polymer production – Industrial

22.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in polymer production of Toluene;CAS RN 108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU10)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC14, PROC21
	Environmental Release Categories: ERC4, ERC6C
Processes, tasks, activities covered	Manufacture of polymers from monomers in continuous and batch processes, include sparging, discharging, and reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation, product off-gassing).
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
General exposures (closed systems) [CS15]. Continuous process [CS54]. ; No sampling [CS57].	No specific measures identified [E118].
Bulk transfers [CS14]. Transport [CS58]. ; With sample collection [CS56].	Ensure operation is undertaken outdoors [E69].or [G9], Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Polymerisation (bulk and batch) [CS65] Continuous process [CS54]. ; With sample collection [CS56].	No specific measures identified [E118].



Finishing operations [CS102] Batch process [CS55]. ; With sample collection [CS56].	No specific measures identified [E118].
Intermediate polymer storage [CS66]	No specific measures identified [E118].
Additivition and stabilisation [CS69]	No specific measures identified [E118].
Mixing in containers [CS23].Batch process [CS55].	Ensure operation is undertaken outdoors [E69].or [G9], Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].Wear suitable gloves tested to EN374 [PPE15].
Pelletizing [CS53]. Extrusion and masterbatching [CS88]	Provide extract ventilation to points where emissions occur [E54]. ; Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].Wear suitable gloves tested to EN374 [PPE15].
Pelletizing [CS53].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Pelletisation and pellet screening [CS68](open systems) [CS108]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Bulk transfers [CS14]. Continuous process [CS54]. ; With sample collection [CS56].	No specific measures identified [E118].
Transport [CS58]. With sample collection [CS56].	No specific measures identified [E118].
Equipment maintenance [CS5].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2	Environmental exposure	
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1 using default release fractions from ESVOC SpERC 4.20.v1	
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.	
Amounts Used	EU tonnage	15 ktons/year
	Regional tonnage	1.5 ktons/year
	Fraction of main local source	1.00E+00
Frequency and duration of use	Emission days per year	300
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	0.002
	Release fraction to waste water from process	0.003
	Release fraction to soil from process (regional only)	0.0001



Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emissions to provide a typical removal efficiency of >80%. [TCR 7]
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]
	Prevent discharge of undissolved substance to or recover from wastewater [TCR14].
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils [OMS2].
	Sludge should be incinerated, contained or reclaimed [OMS3].
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment is 93.3 (%) [STP3]
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]
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. [ETW 5]
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated. [EWR 3]
Other environmental control measures additional to above	None

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Soil	
	Msafe: 51440 kg/day before RMM	
Site Tonnage	1.5 ktons/year	
On-site emission factors	93.3 % efficiency water, 80 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0.3	
Typical release to water after RMM	5.10E-02 mg/l	

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.



3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.



23. Exposure assessment 23: Use of toluene in polymer processing – Industrial

23.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in polymer processing of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Industrial (SU3, SU10)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC21
	Environmental Release Categories: ERC 4, ERC 6d
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.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only,.
Bulk transfers [CS14]. ; (closed systems) [CS107]	No specific measures identified [E18].
Bulk transfers [CS14]. ; (closed systems) [CS107]With occasional controlled exposure [CS137]	No specific measures identified [E18].
Bulk transfers [CS14]. Dedicated facility [CS81].	Ensure operation is undertaken outdoors [E69]. Or [G9], Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Bulk weighing [CS91](closed systems) [CS107].	No specific measures identified [E18].



Bulk weighing [CS91]With occasional controlled exposure [CS137]	No specific measures identified [E118].
Small scale weighing [CS90]	Ensure material transfers are under containment or extract ventilation [E66].
Additive premixing [CS92](closed systems) [CS107]	No specific measures identified [E118].
Additive premixing [CS92](open systems) [CS108]; With sample collection [CS56].	No specific measures identified [E118].
Additive premixing [CS92] General exposures (open systems) [CS16].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Bulk transfers [CS14]. Drum/batch transfers [CS8].	Ensure material transfers are under containment or extract ventilation [E66]. .
Bulk transfers [CS14]. Small package filling [CS7].	Ensure material transfers are under containment or extract ventilation [E66].
Calendering (including Banburys) [CS64]	Restrict area of openings to equipment [E68].Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Production of articles by dipping and pouring [CS113].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Extrusion and masterbatching [CS88]	No specific measures identified [E118].
Injection moulding of articles [CS89]	No specific measures identified [E118].
Equipment maintenance [CS5].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2		
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1 using default release fractions from ESVOC SpERC 4.21a.v1	
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.	
Amounts Used	EU tonnage	15 ktons/year
	Regional tonnage	1.5 ktons/year
	Fraction of main local source	1.00E+00
Frequency and duration of use	Emission days per year	300
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Other Operational Conditions of use affecting	Release fraction to air from process	0.1



environmental exposure	Release fraction to waste water from process	0
	Release fraction to soil from process (regional only)	0.00001
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emissions to provide a typical removal efficiency of >80%. [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
	Prevent discharge of undissolved substance to or recover from wastewater [TCR14].	
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils [OMS2].	
	Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment is 93.3 (%) [STP3]	
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]	
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. [ETW 3]	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.[ERW 1]	
Other environmental control measures additional to above	None	

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Soil	
	Msafe: 1923077 kg/day before RMM	
Site Tonnage	1.5 ktons/year	
On-site emission factors	93.3 % efficiency water, 80 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	0	
Typical release to water after RMM	7.85E-04 mg/l	

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and



	operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.



24. Exposure assessment 24: Use of toluene in polymer processing – Professional

24.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in polymer processing of Toluene;CAS RN 108-88-3
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC 6, PROC8a, PROC8b, PROC14, PROC21
	Environmental Release Categories: ERC 8A, ERC 8C, ERC 8D, ERC8F
Processes, tasks, activities covered	Processing of formulated polymers including material transfers, moulding and forming activities, material re-works and associated maintenance.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required	Worker exposure was estimated using ECETOC TRAv2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
Bulk transfers [CS14]. ; (closed systems) [CS107]	No specific measures identified [E118].
Bulk transfers [CS14]. ; (closed systems) [CS107]With occasional controlled exposure [CS137]	No specific measures identified [E118].
Material transfers [CS3].	Ensure operation is undertaken outdoors [E69], or [G9], Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].



Injection moulding of articles [CS89]	Restrict area of openings to equipment [E68]. Provide extract ventilation to points where emissions occur [E54].
Rework of articles [CS86]	No specific measures identified [E118].
Equipment maintenance [CS5].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67]	No specific measures identified [E118].
Storage [CS67] with occasional controlled exposure [CS137]	Ensure operation is undertaken outdoors [E69], or [G9], Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].

Section 2.2		
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1 using default release fractions from ESVOC SpERC 8.21b.v1	
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.	
Amounts Used	EU tonnage	15 ktons/year
	Regional tonnage	1.5 ktons/year
	Fraction of main local source	2.00E-03
Frequency and duration of use	Emission days per year	365
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	0.98
	Release fraction to waste water from process	0.01
	Release fraction to soil from process (regional only)	0.01
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emissions to provide a typical removal efficiency of >0% [TCR7].	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
Organisation measures to prevent/limit release from site	OMS 2: 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 is 93.3 (%) [STP3]	
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]	
Conditions and measures related to external treatment of waste for disposal	ETW 3: External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	ERW 1: External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Other environmental control measures additional to above	None	



Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Freshwater	
	Msafe: 5269 kg/day before RMM	
Site Tonnage	0.003 ktons/year	
On-site emission factors	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	1	
Typical release to water after RMM	1.06E-03 mg/l	

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Confirm that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3% which would be typically found in waste-water treatment plant.



25. Exposure assessment 25: Use of toluene in agrochemical use – Professional

25.1. Exposure scenario

Section 1	Exposure Scenario Title
Title	Use in agrochemicals of Toluene;CAS RN108-88-3
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC 4, PROC8a, PROC8b, PROC11, PROC13
	Environmental Release Categories: ERC8A, ERC 8D
Processes, tasks, activities covered	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including storage, equipment clean-downs and disposal.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required	Worker exposure was estimated using ECETOC TRAV2.
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure is 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes use at not > 20 °C above ambient, unless stated differently [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	Risk Management Measures
	Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection. Phrases between brackets are good practice advice only.
Transfer from/pouring from containers [CS22].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Mixing in containers [CS23].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Spraying/fogging by manual application [CS24].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], or [G9]. Ensure operation is undertaken outdoors [E69]. Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]



Spraying/fogging by machine application [CS25].	Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 [E70].
Ad hoc manual application via trigger sprays, dipping, etc. [CS27].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], or [G9], Ensure operation is undertaken outdoors [E69]. .Avoid carrying out operation involving exposure for more than 4 hours [OC28].
Clean down and maintenance [CS26].Non-dedicated facility [CS82].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], or [G9], Ensure operation is undertaken outdoors [E69]. .Avoid carrying out operation involving exposure for more than 4 hours [OC28].
Disposal of wastes [CS28]. Non-dedicated facility [CS82].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], or [G9], Ensure operation is undertaken outdoors [E69]. .Avoid carrying out operation involving exposure for more than 4 hours [OC28].
Storage [CS67] with occasional controlled exposure [CS137]	No specific measures identified [E118].

Section 2.2		
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1 using default release fractions from ESVOG SpERC 8.11a.v1	
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.	
Amounts Used	EU tonnage	15 ktons/year
	Regional tonnage	1.5 ktons/year
	Fraction of main local source	2.00E-03
Frequency and duration of use	Emission days per year	365
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	0.9
	Release fraction to waste water from process	0.01
	Release fraction to soil from process (regional only)	0.09
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organisation measures to prevent/limit release from site	Treat air emissions to provide a typical removal efficiency of >0%. [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
	Prevent environmental discharge consistent with regulatory requirements. [OMS 4]	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment is 93.3 (%) [STP3]	



	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]
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. [ETW 3]
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.[ERW 1]
Other environmental control measures additional to above	Not applicable

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Freshwater	
	Msafe: 5269 kg/day before RMM	
Site Tonnage	0.003 ktons/year	
On-site emission factors	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	1	
Typical release to water after RMM	1.06E-03 mg/l	

Section 3	Exposure Estimation
3.1. Health	When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2. Environment	When the recommended risk management measures (RMMs) and operational 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.
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	Check that RMMs and OCs are as described or of equivalent efficiency.
4.2. Environment	Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.3%



	which would be typically found in waste-water treatment plant.



26. Exposure assessment 26: Use of toluene in agrochemical use – Consumer

26.1. Exposure scenario

Section 1		Exposure Scenario Title
Title		Agrochemicals
Sector of Use (SU code)		21
Use Descriptor (PC codes)		PC12, PC27 (PC22)
Processes, tasks, activities covered		Covers the consumer use in agrochemicals in liquid and solid forms.
Environmental Release Category		8a, 8d
Specific Environmental Release Category		ESVOC SpERC 8.11b. v1
Section 2		Operational conditions and risk management measures
Field for additional statements to explain scenario if required - pending better understanding from ECHA		
Section 2.1		Control of consumer exposure
Product characteristics		
Physical form of product		liquid
Vapour pressure		3089
Concentration of substance in product		Unless otherwise stated, cover concentrations up to 22% [ConsOC1]
Amounts used		Unless otherwise stated, covers use amounts up to 0g [ConsOC2]; covers skin contact area up to 857.5cm ² [ConsOC5]
Frequency and duration of use/exposure		Unless otherwise stated, covers use frequency up to 1 times per day [ConsOC4]; covers exposure up to 2 hours per event [ConsOC14]
Other Operational Conditions affecting exposure		Unless otherwise stated assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m ³ room [ConsOC11]; assumes use with typical ventilation [ConsOC8].
Section 2.1.1		Product categories
PC12:Fertilizers--Lawn and garden preparations	OC	Unless otherwise stated, covers concentrations up to 22% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm ² [ConsOC5]; for each use event, assumes swallowed amount of 0.3g [ConsOC13]; covers use in room size of 20m ³ [ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated



PC27_n: Plant protection products--	OC	Unless otherwise stated, covers concentrations up to 22% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm ² [ConsOC5]; for each use event, assumes swallowed amount of 0.3g [ConsOC13]; covers use in room size of 20m ³ [ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated

Section 2.2		
Assessment method	Environmental exposure and indirect exposure of humans through the environment were estimated using EUSES 2.1.1 using default release fractions from ESVOC SpERC 8.11b.v1	
Product characteristics	Toluene is a liquid of medium volatility. The water solubility is 573 mg.l ⁻¹ ; the vapour pressure is 4030 Pa; and the log Kow is 2.73. Toluene is readily biodegradable.	
Amounts Used	EU tonnage	15 ktons/year
	Regional tonnage	1.5 ktons/year
	Fraction of main local source	2.00E-03
Frequency and duration of use	Emission days per year	365
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	10
	Local marine water dilution factor	100
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	0.9
	Release fraction to waste water from process	0.01
	Release fraction to soil from process (regional only)	0.09
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% [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.3%. [TCR 11]	
Organisation measures to prevent/limit release from site	Prevent environmental discharge consistent with regulatory requirements. [OMS4]	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment is 93.3 (%) [STP3]	
	Assumed domestic sewage treatment plant flow is 2000 (m ³ /d) [STP5]	
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 [ETW3].	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]	
Other environmental control measures additional to above	None	



Section 3		Exposure Estimation
3.1. Health		
		When the operational 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.
3.2. Environment		
		When the recommended risk management measures (RMMs) and operational 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.
Section 4		Guidance to check compliance with the Exposure Scenario
4.1. Health		
Health sub-headings		Check that RMMs and OCs are as described or of equivalent efficiency..
4.2. Environment		
Environment sub-headings		Check that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.67% which would be typically found in waste-water treatment plant.

Values for Scaling Purposes		
DSU 4 : Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Basis for scaling	Environment	
	Risk-driving Compartment – Freshwater	
	Msafe: 6849 kg/day before RMM	
Site Tonnage	0.003 ktons/year	
On-site emission factors	93.3 % efficiency water, 0 % efficiency air	
Dilution factors	Freshwater	10
	Marine water	100
Initial release percent at site to water (before RMM)	1	
Typical release to water after RMM	8.13E-04 mg/l	



