9. EXPOSURE ASSESSMENT

The following generic uses were evaluated in the exposure assessment of streams in the xylenes category. The worker assessment was conducted using ethylbenzene as the marker substance as indicated in section 5 of this report.

The worker exposure estimates for the activities associated with the manufacture of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). The exposure modelling was conducted using ethylbenzene as the marker substance with the model default of >25% concentration which assumes that the stream is 100% ethylbenzene. Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

Identified use	Process category (PROC)	Product Category (PC)	Sector of Use (SU)	Article category (AC)	Environmental Release Category (ERC)	EU tonnage (ktonnes)	Regional fraction
Manufacture (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15	NA	3, 8, 9	NA	1,4	1000	0.1
Distribution (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15	NA	3, 8, 9	NA	1-7	1000	0.1
Use as Intermediate (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15	NA	3, 8, 9	NA	6a	150	0.1
Formulation (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15	NA	3, 10	NA	2	150	0.1
Coatings (Industrial)	PROC1, PROC2,	NA	3	NA	4 50		0.1

Identified use	Process category (PROC)	Product Category (PC)	Sector of Use (SU)	Article category (AC)	Environmental Release Category (ERC)	EU tonnage (ktonnes)	Regional fraction
	PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC15						
Coatings (Professional)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19	NA	22	NA	8a, 8d	50	0.1
Coatings (Consumer)	NA	PC1, PC4, PC8, PC9, PC15, PC18, PC23, PC24, PC31, PC34	21	NA	8a, 8d	50	0.1
Cleaning agents (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13	NA	3	NA	4	50	0.1
Cleaning agents (Professional)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13	NA	22	NA	8a, 8d	50	0.1
Cleaning agents (Consumer)	NA	PC3, PC4, PC8, PC9, PC24, PC35, PC38	21	NA	8a, 8d	50	0.1
Lubricants (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a,	NA	3	NA	7, 4	50	0.1

Identified use	Process category (PROC)	Product Category (PC)	Sector of Use (SU)	Article category (AC)	Environmental Release Category (ERC)	EU tonnage (ktonnes)	Regional fraction
	PROC8b, PROC9, PROC10, PROC13, PROC17, PROC 18						
Lubricants (Professional)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC 11, PROC13, PROC17, PROC 18, PROC20	NA	22	NA	8a, 8d, 9a, 9b	50	0.1
Lubricants (Consumer)	NA	PC1, PC24, PC31	21	NA	8a, 8d, 9a, 9b	50	0.1
Binders (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14	NA	3	NA	4	50	0.1
Binders (Professional)	PROC1, PROC2, PROC3, PROC4, PROC6, PROC 8a, PROC8b, PROC10, PROC11, PROC14	NA	22	NA	8a, 8d	50	0.1
Agrochemicals (Professional)	PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13	NA	22	NA	8a, 8d	50	0.1
Agrochemicals (Consumer)	NA	PC12, PC27	21	NA	8a, 8d	50	0.1
Fuels (Industrial)	PROC1, PROC2, PROC3, PROC8a,	NA	3	NA	7	50	0.1

Identified use	Process category (PROC)	Product Category (PC)	Sector of Use (SU)	Article category (AC)	Environmental Release Category (ERC)	EU tonnage (ktonnes)	Regional fraction
	PROC8b, PROC16						
Fuels (Professional)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16	NA	22	NA	9a, 9b	1	0.1
Fuels (Consumer)	NA	13	21	NA	9a, 9b	1	0.1
Polymer Production (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC14, PROC21	NA	3, 10	NA	4, 6c	1	0.1
Polymer Processing (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC21	NA	10	NA	4	50	0.1
Polymer Processing (Professional)	PROC1, PROC2, PROC 6, PROC8a, PROC8b, PROC14, PROC21	NA	22	NA	8a, 8d	50	0.1
Functional Fluids (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9	NA	3	NA	7	1	0.1
Functional Fluids (Professional)	PROC1, PROC2, PROC3, PROC8a, PROC9, PROC20	NA	22	NA	9a, 9b	1	0.1

Identified use	Process category (PROC)	Product Category (PC)	Sector of Use (SU)	Article category (AC)	Environmental Release Category (ERC)	EU tonnage (ktonnes)	Regional fraction
Functional Fluids (Consumer)	NA	16, 17	21	NA	9a, 9b	1	0.1
Oil Fields (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b	NA	3	NA	4	1	0.1
Oil Fields (Professional)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b	NA	22	NA	8d	1	0.1
Road Construction (Professional)	PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13	NA	22	NA	8d, 8f	1	0.1
Laboratory Applications (Industrial)	PROC10, PROC15	NA	3	NA	2, 4	1	0.1
Laboratory Applications (Professional)	PROC 10, PROC 15	NA	22	NA	8a	1	0.1
Exposives (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15	NA	3	NA	2	1	0.1
Rubber Production (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC 9, PROC13, PROC14, PROC 15, PROC21	NA	3, 10	NA	1, 4, 6d	1	0.1
Mining Chemicals (Industrial)	PROC1, PROC2, PROC3, PROC4, PROC5,	NA	3	NA	4	1	0.1

Identified use	Process category (PROC)	Product Category (PC)	Sector of Use (SU)	Article category (AC)	Environmental Release Category (ERC)	EU tonnage (ktonnes)	Regional fraction
	PROC8a, PROC8b, PROC9						

The following information was used for the environmental exposure assessments:

Substance specific information				Reference Values	
Substance	Streams in the xylenes category	**MOLW**	107.175	**$PNEC_{aqua}$ mgl^{-1}**	0.327
		MP	-20°C	**$PNEC_{marine}$ mgl^{-1}**	0.327
Vapour pressure	821 Pa at 20°C	**BP**	139.6°C	**$PNEC_{STP}$ mgl^{-1}**	6.58
TRA volatility range	Medium	**SOL**	165.8mg/l	**PNECsediment $mgkg^{-1}$**	12.46
physical property	Readily biodegradable	**Log KOW**	3.16	**$PNEC_{soil}$ $mgkg^{-1}$**	2.31

9a Skin irritation (R38) qualitative assessment

This general qualitative CSA approach aims to reduce/avoid contact or incidents with the substance. However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance. Exposures should be controlled to at least the levels that represent an acceptable level of risk, i.e. implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the hazard of the substance is negligible, and the risk is considered to be controlled to a level of no concern.

For skin irritation a qualitative risk characterisation was conducted. Handling and storage risk management measures that are generally identified for skin irritation and identified in the Table given in Appendix D.

A review of these RMMs indicates that if the user complies with the following generic statements, risks due to skin irritation can be considered to be adequately controlled:

> E3: Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if direct hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.

Plus (where there is the potential for additional and significant aerosol exposure, e.g. associated with PROCs 7, 11, 17 or 18):

> E4: Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g.

spraying.

9b Aspiration hazard (R65) qualitative assessment

_Aspiration‘ means the entry of a liquid substance directly into the trachea and lower respiratory tract. Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degrees of pulmonary injury or death. This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage. Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties.

The R65 risk phrase (Harmful: may cause lung damage if swallowed) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived.

This general qualitative CSA approach aims to reduce/avoid contact or incidents with the substance. However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance. Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern.

There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk. For any substance, classified as R65, these measures should be communicated via the safety data sheet by use of the following phrase:

- Do not ingest. If swallowed then seek immediate medical assistance.

9.1. Exposure scenario 1: Manufacture of streams in the xylenes category

9.1.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Manufacture of streams in the xylenes category**
Use Descriptor	Sector of Use: Industrial (SU3)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15
	Environmental Release Categories: ERC1, ERC4
Processes, tasks, activities covered	Manufacture of this substance 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**
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 > 20ºC above ambient [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
General exposures (closed systems) [CS15].	Handle substance within a closed system [E47].
General exposures (closed systems) [CS15]. With sample collection [CS56]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].
General exposures (closed systems) [CS15]. Use in contained batch processes [CS37].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
General exposures (open systems) [CS16]. Batch process [CS55]. With sample collection [CS56].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].

Process sampling [CS2].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Laboratory activities [CS36].	No specific measures identified [EI18].
Bulk transfers [CS14]. (open systems) [CS108]. With potential for aerosol generation [CS138].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Bulk transfers [CS14]. (closed systems) [CS107].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Equipment cleaning and maintenance [CS39].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from SpERC fact sheet (See Appendix C)	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1000 ktonnes/year
	Regional tonnage	100 ktonnes/year
	Fraction of main local source	0.5
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 (See Appendix C) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMMs	0.01
	Release fraction to waste water from process before RMMs	0.0001
	Release fraction to soil from process before RMMs	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 >90%. [TCR 7]
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [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 93.67 (%) [STP3]
	Assumed domestic sewage treatment plant flow 2000 (m^3/d) [STP5]
Conditions and measures related to external treatment of waste for disposal	During manufacturing no waste of the substance is generated. [ETW 4]
Conditions and measures related to external recovery of waste	During manufacturing no waste of the substance is generated. [EWR 2]
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, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1 as indicated in Appendix A.

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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

Appendix C and http://cefic.org/en/reach-for-industries-libraries.html.		
Basis for scaling	Environment	
	Risk-driving Compartment – Sewage Treatment Plant	
	Msafe 2.08E+06 kg/day after RMM	
Site Use	50 ktonnes/year	
On-site emission factors	93.67 % efficiency water, 90 % efficiency air	
Dilution factors	Freshwater	40
	Marine water	100
Initial release percent at site to water (before RMM)		0.01
Typical release to water after RMM		1.38E-02 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.1.2. Exposure estimation

9.1.2.1. Workers exposure

The worker exposure estimates for the activities associated with the manufacture of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.1.2.2. Consumer exposure

Not applicable.

9.1.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.1.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.1.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.2. Exposure scenario 2: Distribution of streams in the xylenes category

9.2.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Distribution of streams in the xylenes category**
Use Descriptor	Sector of Use: Industrial (SU3, SU8, SU9)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15
	Environmental Release Categories: ERC1 -7
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**
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 [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
General exposures (closed systems) [CS15].	Handle substance within a closed system [E47].
General exposures (closed systems) [CS15]. With sample collection [CS56]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].
General exposures (closed systems) [CS15]. Use in contained batch processes [CS37].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
General exposures (open systems) [CS16]. Batch process [CS55]. With sample collection [CS56].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Process sampling [CS2].	Handle substance within a closed system [E47]. 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 [EI18].

Bulk transfers [CS14]. (closed systems) [CS107].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Bulk transfers [CS14]. (open systems) [CS108].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Drum and small package filling [CS6].	Transfer via enclosed lines [E52].
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].	Handle substance within a closed system [E47].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default release fractions from ESVOC SpERC 1.1b.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1000 ktonnes/year
	Regional tonnage	100 ktonnes/year
	Fraction of main local source	0.002
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 RMMs	0.001
	Release fraction to waste water from process before RMMs	0.00001
	Release fraction to soil from process before RMMs	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 >90%. [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [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 93.67 (%) [STP3]
	Assumed domestic sewage treatment plant flow 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.[EWR 1]
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, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1 as indicated in Appendix A.*
	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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*
	1
4.2. Environment	*Confirm 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 Sediment
	Msafe 2.58E+05 kg/day after RMM
Site Use	0.2 ktonnes/year

On-site emission factors	93.67 % efficiency water, 90 % 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		6.51E-04 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.2.2. Exposure estimation

9.2.2.1. Workers exposure

The worker exposure estimates for the activities associated with the distribution of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.2.2.2. Consumer exposure

Not applicable.

9.2.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.2.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.2.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.3. Exposure scenario 3: Use as an intermediate of streams in the xylenes category

Human health assessment is not required for this use, as use an intermediate is included in the manufactureof streams in the xylenes category, see section 9.1.

9.3.1. Exposure scenario

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 6.1a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable.	
Amounts Used	EU tonnage	150 ktonnes/year
	Regional tonnage	15 ktonnes/year
	Fraction of main local source	0.25
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 RMMs	0.001
	Release fraction to waste water from process before RMMs	0.003
	Release fraction to soil from process before RMMs	0.001
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 93.67%. [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 93.67 (%) [STP3]	

	Assumed domestic sewage treatment plant flow 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

Section 3	**Exposure Estimation**
3.1. Health	*Not applicable*
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	*Not applicable*
4.2. Environment	*Confirm 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 – Soil	
	Msafe 16984 kg/day after RMM	
Site Use	3.75 ktonnes/year	
On-site emission factors	93.67 % 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	1.19E-01 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.3.2. Exposure estimation

9.3.2.1. Workers exposure

Not applicable

9.3.2.2. Consumer exposure

Not applicable

9.3.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.3.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.3.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.4. Exposure scenario 4: Formulation and (re)packaging of substances and mixtures of streams in the xylenes category

9.4.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Formulation & (re)packaging of substances and mixtures of streams in the xylenes category**
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**
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 [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
General exposures (closed systems) [CS15].	Handle substance within a closed system [E47].
General exposures (closed systems) [CS15]. With sample collection [CS56]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].
General exposures (closed systems) [CS15]. Use in contained batch processes [CS37].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
General exposures (open systems) [CS16]. Batch process [CS55]. With sample collection [CS56]. With potential for aerosol generation [CS138].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Batch processes at elevated temperatures [CS136].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].

Process sampling [CS2].	Handle substance within a closed system [E47]. 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 [EI18].
Bulk transfers [CS14].	Ensure material transfers are under containment or extract ventilation [E66].
Mixing operations (open systems) [CS30]. With potential for aerosol generation [CS138].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Manual [CS34]. Transfer from/pouring from containers [CS22].	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 or controlled ventilation (10 to 15 air changes per hour) [E40].
Production or preparation or articles by tabletting, compression, extrusion or pelletisation [CS100].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Drum and small package filling [CS6].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
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].	Handle substance within a closed system [E47].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 2.2.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	150 ktonnes/year
	Regional tonnage	15 ktonnes/year
	Fraction of main local source	0.25
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 before RMMs	0.01
	Release fraction to waste water from process before RMMs	0.002
	Release fraction to soil from process before RMMs	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 0%. [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [TCR 11]	
	Prevent discharge of undissolved substance to or recover from wastewater [TCR14].	
	Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): [OOC11]	
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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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.[EWR 1]	
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, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

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4.2. Environment	*Confirm 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 – Soil	
	Msafe 6.31 kg/day after RMM	
Site Use	3.75 ktonnes/year	
On-site emission factors	93.67 % 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		7.96E-02 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.4.2. Exposure estimation

9.4.2.1. Workers exposure

The worker exposure estimates for the activities associated with the formulation and (re)packaging of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.4.2.2. Consumer exposure

Not applicable.

9.4.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.4.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.4.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.5. Exposure scenario 5: Use of streams in the xylenes category in coatings - Industrial

9.5.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Use in coatings of streams in the xylenes category**
Use Descriptor	Sector of Use: Industrial (SU3)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, 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**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa [OC5].
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**
General exposures (closed systems) [CS15].	Handle substance within a closed system [E47].
General exposures (closed systems) [CS15]. With sample collection [CS56]. Use in contained systems [CS38].	Handle substance within a closed system [E47].
Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing [CS94].	Handle substance within a closed system [E47].
Mixing operations (closed systems) [CS29]. General exposures (closed systems) [CS15].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Film formation - air drying [CS95].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].

Preparation of material for application [CS96]. Mixing operations (open systems) [CS30].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Spraying (automatic/robotic) [CS97].	Carry out in a vented booth provided with laminar airflow [E59].
Manual [CS34]. Spraying [CS10].	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].	Ensure material transfers are under containment or extract ventilation [E66].
Material transfers [CS3]. Dedicated facility [CS81].	Ensure material transfers are under containment or extract ventilation [E66].
Roller, spreader, flow application [CS98].	Provide extract ventilation to points where emissions occur [E54].
Dipping, immersion and pouring [CS4].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Laboratory activities [CS36].	No specific measures identified [EI18].
Material transfers [CS3]. Drum/batch transfers [CS8]. Transfer from/pouring from containers [CS22].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Production or preparation or articles by tabletting, compression, extrusion or pelletisation [CS100].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Equipment cleaning and maintenance [CS39].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 4.3a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/year
	Fraction of main local source	1
Frequency and duration of use	Emission days per year	300

Environmental Factors not influenced by risk	Local Freshwater dilution	10

management	factor	
	Local marine water dilution factor	100
Conditions given in SPERC fact sheet (ESVOC SpERC 4.3.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMMs	0.098
	Release fraction to waste water from process before RMMs	0.007
	Release fraction to soil from process before RMMs	0
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 >90%. [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [TCR 11]	
	Soil emission controls are not applicable as there is no direct release to soil. [TCR 4]	
	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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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	

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 – Soil	
	Msafe 68871 kg/day after RMM	
Site Use	5 ktonnes/year	
On-site emission factors	93.67 % 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		3.75E-02 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	

Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.5.2. Exposure estimation

9.5.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use of streams in the xylenes category in coatings (industrial) were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.5.2.2. Consumer exposure

See section 9.7.

9.5.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.5.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.5.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.6. Exposure scenario 6: Use of streams in the xylenes category in coatings - Professional

9.6.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Use in coatings of streams in the xylenes category**
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**
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 [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
General exposures (closed systems) [CS15].	Handle substance within a closed system [E47].
Filling / preparation of equipment from drums or containers. [CS45].	Handle substance within a closed system [E47]. Ensure material transfers are under containment or extract ventilation [E66].
General exposures (closed systems) [CS15]. Use in contained systems [CS38].	Handle substance within a closed system [E47]. Ensure material transfers are under containment or extract ventilation [E66].
Preparation of material for application [CS96].	Handle substance within a closed system [E47]. Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Film formation - air drying [CS95]. Outdoor [OC9].	Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 1 hour [OC27]. Wear suitable gloves tested to EN374 [PPE15].

Film formation - air drying [CS95]. Indoor [OC8].	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].
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]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Preparation of material for application [CS96]. Outdoor [OC9].	Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Material transfers [CS3]. Drum/batch transfers [CS8].	Transfer via enclosed lines [E52].Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Material transfers [CS3]. Drum/batch transfers [CS8].	Transfer via enclosed lines [E52]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Roller, spreader, flow application [CS98]. Indoor [OC8].	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].
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 provided with laminar airflow [E59].
Manual [CS34]. Spraying [CS10]. Outdoor [OC9].	Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 4 hours [OC28]. Wear suitable gloves tested to EN374 [PPE15]. Wear a full face respirator conforming to EN140 with Type A filter or better. [PPE24].
Dipping, immersion and pouring [CS4]. Indoor [OC8].	Provide extract ventilation to points where emissions occur [E54]. Avoid carrying out activities involving exposure for more than 4 hours [OC28].
Dipping, immersion and pouring [CS4]. Outdoor [OC9].	Ensure operation is undertaken outdoors [E69]. Wear a respirator conforming to EN140 with Type A filter or better [PPE22].
Laboratory activities [CS36].	Handle in a fume cupboard or under extract ventilation [E83].
Hand application - fingerpaints, pastels, adhesives [CS72]. Indoor [OC8].	Limit the substance content in the product to 5% [OC17]. Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. Wear suitable gloves tested to EN374 [PPE15].
Hand application - fingerpaints, pastels, adhesives [CS72]. Outdoor [OC9].	Limit the substance content in the product to 5% [OC17]. Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 4 hours [OC28]. Wear suitable gloves tested to EN374 [PPE15].
Equipment cleaning and maintenance [CS39].	Drain down system prior to equipment break-in or maintenance [E65].Avoid carrying out activities involving exposure for more than 4 hours [OC28].

Storage [CS67]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47]. 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	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 8.3b.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/year
	Fraction of main local source	0.002
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 RMMs	0.98
	Release fraction to waste water from process before RMMs	0.01
	Release fraction to soil from process before RMMs	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%. [TCR 7] Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [TCR 11]	
Organisation measures to prevent/limit release from site	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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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

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 as indicated in Appendix A.

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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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

1

4.2. Environment	*Confirm 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 sediment	
	Msafe 4628 kg/day after RMM	
Site Use	0.01 ktonnes/year	
On-site emission factors	93.67 % 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	1.50E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.6.2. Exposure estimation

9.6.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use of streams in the xylenes category in coatings (professional) were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.6.2.2. Consumer exposure

See section 9.7.

9.6.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.6.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.6.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.7. Exposure scenario 7: Use of streams in the xylenes category in coatings – Consumer

9.7.1. 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
Processes, tasks, activities covered		Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.
Environmental Release Category		ERC 8a, ERC 8d
Specific Environmental Release Category		ESVOC SpERC 8.3c.v1
Section 2		**Operational conditions and risk management measures**
Section 2.1		**Control of consumer exposure**
Product characteristics		
Physical form of product		liquid
Vapour pressure		950 Pa
Concentration of substance in product		Unless otherwise stated, cover concentrations up to 100% [ConsOC1]
Amounts used		Unless otherwise stated, covers use amounts up to 6900g [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**
PC1:Adhesives, sealants--Glues, hobby use	OC	Unless otherwise stated, covers concentrations up to 30% [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 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 9g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated

PC1:Adhesives, sealants--Glues DIY-use (carpet glue, tile glue, wood parquet glue)	OC	Unless otherwise stated, covers concentrations up to 0.2% [ConsOC1]; covers use up to 1 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.70 cm2 [ConsOC5]; for each use event, covers use amounts up to 6390g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 6.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants--Glue from spray	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 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 85.05g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants--Sealants	OC	Unless otherwise stated, covers concentrations up to 25% [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 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 75g [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
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 typcial 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 typcial 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 typcial 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 0.5% [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
PC9a:Coatings and paints, fillers putties, thinners--Solvent rich, high solid, water borne paint	OC	Unless otherwise stated, covers concentrations up to 2% [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
PC9a:Coatings and paints, fillers putties, thinners--Aerosol spray can	OC	Unless otherwise stated, covers concentrations up to 21% [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 typcial 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
PC9a:Coatings and paints, fillers putties, thinners--Removers (paint-, glue-, wall paper-, sealant-remover)	OC	Unless otherwise stated, covers concentrations up to 3% [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
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 cm2 [ConsOC5]; for each use event, covers use amounts up to 85g [ConsOC2]; covers use in room size of 20m3[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 0.3% [ConsOC1]; covers use up to 2 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 6900g [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
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 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1g [ConsOC13]; 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
PC9c:Finger paints --Finger paints	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 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1.35g [ConsOC13]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.03hr/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 0.5% [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 2.2% [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 21% [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 typcial 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 3.4% [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 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,

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		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 25% [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 33% [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 100% [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 typcial 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 15% [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 room size of 20m3[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 45% [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 10% [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 48% [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 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 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	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 8.3c.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/year
	Fraction of main local source	0.002
Frequency and duration of use	Emission days per year	365
Environmental Factors not influenced	Local Freshwater dilution factor	10

by risk management	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) [OOC7]	0.985
	Release fraction to wastewater from wide dispersive use [OOC8]	0.01
	Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.005
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 93.67%. [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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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 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 as indicated in Appendix A.*
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		

		Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.
4.2. Environment		
Environment sub-headings		*Confirm 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 sediment	
	Msafe 4628 kg/day after RMM	
Site Use	0.01 ktonnes/year	
On-site emission factors	93.67 % 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		1.50E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.7.2. Exposure estimation

9.7.2.1. Workers exposure

Not applicable

9.7.2.2. Consumer exposure

The consumer exposure estimates for activities associated with the consumer use in coatings of streams in the xylenes category were assessed using a toll based on the ECETOC TRAv2 (See Appendix A). Appendix A contains input tables used to model the consumer exposures. These tables contain all the operating conditions used to conduct the modelling and the default parameters of the model.

9.7.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.7.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.7.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.8. Exposure scenario 8: Use of streams in the xylenes category in cleaning - Industrial

9.8.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Use in cleaning agents of streams in the xylenes category**
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**
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 [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
	0
Contributing Scenarios	**Risk Management Measures**
Bulk transfers [CS14].	Ensure material transfers are under containment or extract ventilation [E66].
Automated process with (semi) closed systems [CS93]. Use in contained systems [CS38].	Handle substance within a closed system [E47].
Automated process with (semi) closed systems [CS93]. Use in contained systems [CS38]. Drum/batch transfers [CS8]. Use in contained systems [CS38].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Application of cleaning products in closed systems [CS101].	Handle substance within a closed system [E47].
Filling / preparation of equipment from drums or containers. [CS45]. Dedicated facility [CS81].	Provide extract ventilation to points where emissions occur [E54].
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 extract ventilation to points where emissions occur [E54].
Cleaning with low-pressure washers [CS42].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Cleaning with high pressure washers [CS44].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. Avoid carrying out activities involving exposure for more than 1 hour [OC27]. Wear suitable gloves tested to EN374 [PPE15].
Manual [CS34]. Surfaces [CS48]. Cleaning [CS47]. No spraying [CS60].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Equipment cleaning and maintenance [CS39].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 4.4a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/year
	Fraction of 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 RMMs	1
	Release fraction to waste water from process before RMMs	0.00003
	Release fraction to soil from process before RMMs	0
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 >70%. [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [TCR 11]	

	Soil emission controls are not applicable as there is no direct release to soil. [TCR 4]
	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 93.67 (%) [STP3]
	Assumed domestic sewage treatment plant flow 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

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 as indicated in Appendix A.*
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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*
4.2. Environment	*Confirm 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 – Soil	
	Msafe 340832 kg/day after RMM	
Site Use	5 ktonnes/year	
On-site emission factors	93.67 % 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		2.21E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.8.2. Exposure estimation

9.8.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use of streams in the xylenes category in cleaning (industrial) were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.8.2.2. Consumer exposure

See section 9.10.

9.8.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.8.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.8.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.9. Exposure scenario 9: Use of streams in the xylenes category in cleaning - Professional

9.9.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Use in cleaning agents of streams in the xylenes category**
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**
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 [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
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].	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]. Drum/batch transfers [CS8].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products) [CS76].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Filling / preparation of equipment from drums or containers. [CS45]. Outdoor [OC9].	Use drum pumps or carefully pour from container [E64]. Ensure operation is undertaken outdoors [E69].

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]. Wear a respirator conforming to EN140 with Type A filter or better [PPE22].
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 or controlled ventilation (10 to 15 air changes per hour) [E40]. Wear a respirator conforming to EN140 with Type A filter or better [PPE22].
Cleaning with high pressure washers [CS44]. Spraying [CS10]. Outdoor [OC9].	Limit the substance content in the product to 5% [OC17]. 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 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].
Ad hoc manual application via trigger sprays, dipping, etc. [CS27]. Rolling, Brushing [CS51].	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].
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]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Application of cleaning products in closed systems [CS101] Outdoor [OC9].	Handle substance within a closed system [E47]. Ensure operation is undertaken outdoors [E69].
Cleaning of medical devices [CS74].	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60].
Equipment cleaning and maintenance [CS39].	Drain down system prior to equipment break-in or maintenance [E65]. Avoid carrying out activities involving exposure for more than 4 hours [OC28].
Storage [CS67]. With occasional controlled exposure [CS137].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 8.4b.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/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	Local Freshwater dilution factor	10

management	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 RMMs	0.02
	Release fraction to waste water from process before RMMs	0.000001
	Release fraction to soil from process before RMMs	0
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 93.67%. [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	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 93.67 (%) [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	Not applicable	

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 as indicated in Appendix A.*
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	*Confirm that RMMs and OCs are as described or of*

	equivalent efficiency. See Appendix A for details of efficiencies and OC.
4.2. Environment	*Confirm 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 sediment	
	Msafe 11003 kg/day after RMM	
Site Use	0.01 ktonnes/year	
On-site emission factors	93.67 % 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		6.30E-04 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.9.2. Exposure estimation

9.9.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use of streams in the xylenes category in cleaning (professional) were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.9.2.2. Consumer exposure

See section 9.10.

9.9.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.9.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.9.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.10. Exposure scenario 10: Use of streams in the xylenes category in cleaning - Consumer

9.10.1. Exposure scenario

Section 1		**Exposure Scenario Title**
Title		**Use in Cleaning Agents**
Sector of Use (SU code)		21
Use Descriptor (PC codes)		PC3, PC4, PC8, PC9, PC24, PC35, PC38. Note PC8 included based upon indication this will be changed from Coatings to Cleanings in future.
Processes, tasks, activities covered		Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.
Environmental Release Category		ERC 8a, ERC 8d
Specific Environmental Release Category		ESVOC SpERC 8.4c.v1
Section 2		**Operational conditions and risk management measures**
Section 2.1		**Control of consumer exposure**
Product characteristics		
Physical form of product		liquid
Vapour pressure		950 Pa
Concentration of substance in product		Unless otherwise stated, cover concentrations up to 50% [ConsOC1]
Amounts used		Unless otherwise stated, covers use amounts up to 6900g [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 4 times per day [ConsOC4]; covers exposure up to 8 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**
PC3:Air care products--Air care, instant action (aerosol sprays)	OC	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 4 times/day of use[ConsOC4]; for each use event, covers use amounts up to 0.1g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to

		0.25hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC3:Air care products--Air care, continuous action (solid and liquid)	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 35.70 cm2 [ConsOC5]; for each use event, covers use amounts up to 0.48g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 8.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
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 typcial 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 typcial 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 typcial 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 17% [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 0.2% [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
PC9a:Coatings and paints, fillers putties, thinners--Solvent rich, high solid, water borne paint	OC	Unless otherwise stated, covers concentrations up to 2.3% [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
PC9a:Coatings and paints, fillers putties, thinners--Aerosol spray can	OC	Unless otherwise stated, covers concentrations up to 5.5% [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 typcial 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
PC9a:Coatings and paints, fillers putties, thinners--Removers (paint-, glue-, wall paper-, sealant-remover)	OC	Unless otherwise stated, covers concentrations up to 3% [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
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 cm2 [ConsOC5]; for each use event, covers use amounts up to 85g [ConsOC2]; covers use in room size of 20m3[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 0.2% [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 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 6900g [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
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 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1g [ConsOC13]; covers use in room size of 20m3[ConsOC11];
	RMM	No specific RMMs identified beyond those OCs stated
PC9c:Finger paints --Finger paints	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 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1.35g [ConsOC13]; covers use in room size of 20m3[ConsOC11];
	RMM	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Liquids	OC	Unless otherwise stated, covers concentrations up to 50% [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 typcial 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 typcial 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
PC35:Washing and cleaning products (including solvent based 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
PC35:Washing and cleaning products (including solvent based 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
PC35:Washing and cleaning products (including solvent based products)--Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	OC	Unless otherwise stated, covers concentrations up to 17% [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
PC38_n: Welding and soldering products, flux products--NOTE, n_assessment not in TRA	OC	Unless otherwise stated, covers concentrations up to 20% [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 12g [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	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 8.4c.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/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
Conditions given in SPERC fact sheet (ESVOC SpERC 8.4c.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) [OOC7]	0.95
	Release fraction to wastewater from wide dispersive use [OOC8]	0.025
	Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.025
Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Treat air emission to provide a typical removal efficiency of 0% [TCR 7]	
	Typical onsite wastewater treatment technology provides removal	

releases to soil	efficiency of 93.67%. [TCR 11]
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 93.67 (%) [STP3]
	Assumed domestic sewage treatment plant flow 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	Not applicable

Section 3		**Exposure Estimation**
3.1. Health		
Health sub-headings		*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 as indicated in Appendix A.*
3.2. Environment		
Environment sub-headings		*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		*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*
4.2. Environment		
Environment sub-headings		*Confirm 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 – Soil	
	Msafe 2015 kg/day after RMM	
Site Use	0.01 ktonnes/year	
On-site emission factors	93.67 % 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		2.36E-03 mg/l

9.10.2. Exposure estimation

9.10.2.1. Workers exposure

Not applicable

9.10.2.2. Consumer exposure

The consumer exposure estimates for activities associated with the consumer use as a cleaning agent for streams in the xylenes category were assessed using a toll based on the ECETOC TRAv2 (See Appendix A). Appendix A contains input tables used to model the consumer exposures. These tables contain all the operating conditions used to conduct the modelling and the default parameters of the model.

9.10.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.10.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.10.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.11. Exposure scenario 11: Use of streams in the xylenes category in lubricants - Industrial

9.11.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Use in Lubricants of streams in the xylenes category**
Use Descriptor	Sector of Use: Industrial (SU3, SU10)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17
	Environmental Release Categories: ERC 7, ERC 4
Processes, tasks, activities covered	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes.
Section 2	**Operational conditions and risk management measures**
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 [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
General exposures (closed systems) [CS15].	Handle substance within a closed system [E47].
General exposures (closed systems) [CS15]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].
General exposures (closed systems) [CS15]. Batch process [CS55].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
General exposures (open systems) [CS16]. With occasional controlled exposure [CS137].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
General exposures (open systems) [CS16]. Batch process [CS55].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Bulk transfers [CS14]. Dedicated facility [CS81].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Filling / preparation of equipment from drums or containers [CS45]. Non-dedicated facility [CS82].	Use drum pumps or carefully pour from container [E64].

Filling / preparation of equipment from drums or containers [CS45]. Dedicated facility [CS81].	Use drum pumps or carefully pour from container [E64]. Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Initial factory fill of equipment [CS75].	Ensure material transfers are under containment or extract ventilation [E66].
Operation and lubrication of high energy open equipment [CS17]. Indoor [OC8].	Restrict area of openings to equipment [E68]. Provide extract ventilation to points where emissions occur [E54].
Operation and lubrication of high energy open equipment [CS17].	Restrict area of openings to equipment [E68]. Provide extract ventilation to points where emissions occur [E54].
Manual roller application or brushing [CS13].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Treatment by dipping and pouring [CS35].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Spraying [CS10].	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60].
Spraying [CS10].	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60].
Maintenance (of larger plant items) and machine set up [CS77].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Maintenance (of larger plant items) and machine set up [CS77].	Ensure material transfers are under containment or extract ventilation [E66].
Maintenance of small items [CS18].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Remanufacture of reject articles [CS19].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Storage [CS67].	Handle substance within a closed system [E47].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 4.6a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/year
	Fraction of 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 4.6a.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMMs	0.005
	Release fraction to waste water from process before RMMs	0.0003
	Release fraction to soil from process before RMMs	0.001
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 >70%. [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [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 93.97 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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	

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 as indicated in Appendix A.*
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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 – Soil	
	Msafe 169205 kg/day after RMM	
Site Use	5 ktonnes/year	
On-site emission factors	93.67 % efficiency water, 70 % 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		1.64E-02 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.11.2. Exposure estimation

9.11.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use of streams in the xylenes category in lubricants (industrial) were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.11.2.2. Consumer exposure

See section 9.13

9.11.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.11.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.11.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.12. Exposure scenario 12: Use of streams in the xylenes category in lubricants - Professional

9.12.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Use in Lubricants of streams in the xylenes category**
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20
	Environmental Release Categories: ERC 8a, ERC 8d, ERC 9a, ERC 9b
Processes, tasks, activities covered	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.
Section 2	**Operational conditions and risk management measures**
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 daily exposures up to 8 hours (unless stated differently) [G2]
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 [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
General exposures (closed systems) [CS15].	Handle substance within a closed system [E47].
General exposures (closed systems) [CS15]. Batch process [CS55].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
General exposures (closed systems) [CS15].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
General exposures (open systems) [CS16].	Ensure material transfers are under containment or extract ventilation [E66].
Bulk transfers [CS14]. Dedicated facility [CS81].	Transfer via enclosed lines [E52].
Filling / preparation of equipment from drums or containers. [CS45]. Dedicated facility [CS81].	Transfer via enclosed lines [E52].

Filling / preparation of equipment from drums or containers. [CS45]. Non-dedicated facility [CS82].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11]. Use drum pumps or Carefully pour from containers [E64].
Operation and lubrication of high energy open equipment [CS17].	Restrict area of openings to equipment [E68]. Provide extract ventilation to points where emissions occur [E54].
Operation and lubrication of high energy open equipment [CS17].	Restrict area of openings to equipment [E68].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].
Operation and lubrication of high energy open equipment [CS17]. Outdoors [OC9].	Limit the substance content in the product to 5% [OC17]. Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 4 hours [OC 28].
Operation and lubrication of high energy open equipment [CS17].	Limit the substance content in the product to 5% [OC17]. Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Maintenance (of larger plant items) and machine set up [CS77]. Dedicated facility [CS81].	Ensure material transfers are under containment or extract ventilation [E66].
Maintenance (of larger plant items) and machine set up [CS77]. Elevated Temperature.	Provide extract ventilation to emission points when contact with warm (>50 deg C) lubricant is likely [E67]. Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Maintenance of small items [CS18].	Drain down and flush system prior to equipment break-in or maintenance [E55]. Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. Avoid carrying out activities involving exposure for more than 4 hours [OC 28].
Engine lubricant service [CS78].	Transfer via enclosed lines [E52].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]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 9.6b.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/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	Local Freshwater dilution factor	10

management	Local marine water dilution factor	100
Conditions given in SPERC fact sheet (ESVOC SpERC 9.6b.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMMs	0.01
	Release fraction to waste water from process before RMMs	0.01
	Release fraction to soil from process before RMMs	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%. [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [TCR 11]	
Organisation measures to prevent/limit release from site	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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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]	

Exposure

Other environmental control measures additional to above	Not applicable

Section 3	**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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of*

	efficiencies and OC.
4.2. Environment	*Confirm 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 sediment	
	Msafe 4628 kg/day after RMM	
Site Use	0.01 ktonnes/year	
On-site emission factors	93.67 % 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		1.50E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.12.2. Exposure estimation

9.12.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use of streams in the xylenes category in lubricants (professional) were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.12.2.2. Consumer exposure

See section 9.13

9.12.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.12.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.12.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.13. Exposure scenario 13: Use of streams in the xylenes category in lubricants - Consumer

9.13.1. Exposure scenario

Section 1		**Exposure Scenario Title**
Title		**Lubricants**
Sector of Use (SU code)		21
Use Descriptor (PC codes)		PC1, PC24, PC31
Processes, tasks, activities covered		Covers the consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment maintenance and disposal of waste oil.
Environmental Release Category		ERC 8a, ERC 8d, ERC 9a, ERC 9b
Specific Environmental Release Category		ESVOC SpERC 9.6d.v1
Section 2		**Operational conditions and risk management measures**
Section 2.1		**Control of consumer exposure**
Product characteristics		
Physical form of product		liquid
Vapour pressure		950 Pa
Concentration of substance in product		Unless otherwise stated, cover concentrations up to 50% [ConsOC1]
Amounts used		Unless otherwise stated, covers use amounts up to 3195g [ConsOC2]; covers skin contact area up to 468cm2 [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**
PC1:Adhesives, sealants--Glues, hobby use	OC	Unless otherwise stated, covers concentrations up to 30% [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 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 9g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants--Glues DIY-use (carpet glue, tile glue, wood parquet glue)	OC	Unless otherwise stated, covers concentrations up to 0.1% [ConsOC1]; covers use up to 1 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 110.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 3195g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 6.00hr/event[ConsOC14];

	RMM	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants--Glue from spray	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 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 85.05g [ConsOC2]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	RMM	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants--Sealants	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 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 75g [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
PC24: Lubricants, greases, and release products--Liquids	OC	Unless otherwise stated, covers concentrations up to 50% [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 typcial 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 room size of 20m3[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 8% [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 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 18% [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

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 9.6d.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/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
Conditions given in SPERC fact sheet (ESVOC SpERC 9.6d.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) [OOC7]	0.01
	Release fraction to wastewater from wide dispersive use [OOC8]	0.01
	Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.01
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 93.67%. [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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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	None	

additional to above

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 as indicated in Appendix A.
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**
Guidance how the DU can evaluate whether he operates within the conditions set in the exposure scenario - scaling tools. Standard phrases		
4.1. Health		
		Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.
4.2. Environment		
Environment sub-headings		*Confirm 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 sediment	
	Msafe 4628 kg/day after RMM	
Site Use	0.01 ktonnes/year	
On-site emission factors	93.67 % 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	1.50E-03 mg/l

9.13.2. Exposure estimation

9.13.2.1. Workers exposure

Not applicable

9.13.2.2. Consumer exposure

The consumer exposure estimates for activities associated with the consumer use in lubricants for streams in the xylenes category were assessed using a toll based on the ECETOC TRAv2 (See Appendix A). Appendix A contains input tables used to model the consumer exposures. These tables contain all the operating conditions used to conduct the modelling and the default parameters of the model.

9.13.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.13.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.13.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.14. Exposure scenario 14: Use of streams in the xylenes category in binders - Industrial

9.14.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Use in binders and release agents of streams in the xylenes category**
Use Descriptor	Sector of Use: Industrial (SU3, SU8, SU9)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14
Environmental Release Categories:	ERC4
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**
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 > 20ºC above ambient [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Material transfers [CS3].	Handle substance within a closed system [E47].
Material transfers [CS3]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].
Material transfers [CS3]. Batch process [CS55]. (closed systems) [CS107].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Drum/batch transfers [CS8].	Transfer via enclosed lines [E52].
Mixing operations (closed systems) [CS29].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
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]. Avoid carrying out activities involving exposure operation for more than 1 hour [OC27].
Casting operations [CS32].	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60].
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].
Spraying [CS10]. Manual [CS34].	Carry out in a vented booth or extracted enclosure [E57]. Avoid carrying out activities involving exposure operation for more than 4 hours [OC2].
Storage [CS67].	Store substance within a closed system [E84].
Storage [CS67]. With occasional controlled exposure [CS137].	Store substance within a closed system [E84].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 4.10a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/year
	Fraction of 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 RMMs	1
	Release fraction to waste water from process before RMMs	0.00003

	Release fraction to soil from process before RMMs	0
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 93.67%. [TCR 11]	
	Soil emission controls are not applicable as there is no direct release to soil. [TCR 4]	
	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 93. (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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	

Section 3 Estimation	**Exposure**
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 as indicated in Appendix A.*
	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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*
	1
4.2. Environment	*Confirm 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 – Soil	
	Msafe 464253 kg/day after RMM	
Site Use	5 ktonnes/year	
On-site emission factors	93.67 % efficiency water, 80 % 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		2.21E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.14.2. Exposure estimation

9.14.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use of streams in the xylenes category in binders (industrial) were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.14.2.2. Consumer exposure

Not applicable

9.14.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.14.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.14.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.15. Exposure scenario 15: Use of streams in the xylenes category in binders - Professional

9.15.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Use as mould release and binder of streams in the xylenes category**
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC6, PROC 8a, PROC8b, PROC10, PROC11, PROC14
Environmental Release Categories:	ERC8a & 8d
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**
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 > 20ºC above ambient [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Material transfers [CS3]. (closed systems) [CS107].	Handle substance within a closed system [E47].
Material transfers [CS3]. (closed systems) [CS107]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Material transfers [CS3]. (closed systems) [CS107]. Batch process [CS55].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Drum/batch transfers [CS8].	Use drum pumps or carefully pour from container [E64].
Mixing operations (closed systems) [CS29].	Formulate in enclosed or ventilated mixing vessels [E46]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Mixing operations (open systems) [CS30].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].

Mold forming [CS31].	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].
Casting operations [CS32]. (open systems) [CS108].	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60]. Wear a respirator conforming to EN140 with Type A filter or better [PPE22].
Spraying [CS10]. Manual [CS34].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. Minimise exposure by extracted full enclosure for the operation or equipment [E61].
Manual roller application or brushing [CS13].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. Provide extract ventilation to points where emissions occur [E54]. Wear a respirator conforming to EN140 with Type A filter or better [PPE22].
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]. Wear suitable gloves tested to EN374 [PPE15]. Wear a respirator conforming to EN140 with Type A filter or better [PPE22].
Storage [CS67].	Store substance within a closed system [E84].
Storage [CS67]. With occasional controlled exposure [CS137].	Store substance within a closed system [E84]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 8.10b.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/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
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 RMMs	0.95
	Release fraction to waste water from	0.025

	process before RMMs	
	Release fraction to soil from process before RMMs	0.025
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 93.67%. [TCR 11]	
Organisation measures to prevent/limit release from site	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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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	

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 as indicated in Appendix A.*
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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*
4.2. Environment	*Confirm 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 – Soil	
	Msafe 1985 kg/day after RMM	
Site Use	0.01 ktonnes/year	
On-site emission factors	93.67 % 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		2.80E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.15.2. Exposure estimation

9.15.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use of streams in the xylenes category in binders (professional) were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.15.2.2. Consumer exposure

Not applicable

9.15.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.15.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.15.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.16. Exposure scenario 16: Use of streams in the xylenes category in agrochemicals - Professional

9.16.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in agrochemicals of streams in the xylenes category
Use Descriptor	Sector of Use: Professional (SU22)
Process Categories:	PROC1, PROC2, PROC4, 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 equipment clean-downs and disposal.
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	
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 > 20ºC above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Transfer from/pouring from containers [CS22].	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour) [E40].
Mixing in containers [CS23].	Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Spraying/fogging by manual application [CS24].	Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 4 hours [OC28]. Wear suitable gloves tested to EN374 [PPE15]. Wear a full face respirator conforming to EN140 with Type A filter or better [PPE24].
Spraying/fogging by machine application [CS25].	Limit the substance content in the product to 25% [OC18].Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 [E70]. Wear suitable gloves tested to EN374 [PPE15].

Ad hoc manual application via trigger sprays, dipping, etc. [CS27].	Limit the substance content in the product to 25% [OC18]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. Avoid carrying out activities involving exposure for more than 1 hour [OC27]. Wear suitable gloves tested to EN374 [PPE15].
Clean down and maintenance [CS26]. Non-dedicated facility [CS82].	Avoid carrying out activities involving exposure for more than 1 hour [OC27]. Wear suitable gloves tested to EN374 [PPE15].
Disposal of wastes [CS28]. Non-dedicated facility [CS82].	Drain down system prior to equipment break-in or maintenance [E65].Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 1 hour [OC27]. Wear suitable gloves tested to EN374 [PPE15].
Storage [CS67]	Handle substance within a closed system [E47].
Storage [CS67]. With occasional controlled exposure [CS137]	Handle substance within a closed system [E47].Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 8.11a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/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
Conditions given in SPERC fact sheet (ESVOC SpERC 8.11a.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMMs	0.9
	Release fraction to waste water from process before RMMs	0.01
	Release fraction to soil from process before RMMs	0.09

Technical onsite conditions and measures to
Treat air emissions to provide a typical removal efficiency of

reduce or limit discharges, air emissions and releases to soil	>0%. [TCR 7]
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [TCR 11]
Organisation measures to prevent/limit release from site	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 93.67 (%) [STP3]
	Assumed domestic sewage treatment plant flow 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

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 sediment	
	Msafe 4628 kg/day after RMM	
Site Use	0.01 ktonnes/year	
On-site emission factors	93.67 % 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		1.50E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.16.2. Exposure estimation

9.16.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in agrochemicals of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.16.2.2. Consumer exposure

See section 9.17

9.16.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.16.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.16.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.17. Exposure scenario 17: Use of streams in the xylenes category in agrochemicals - Consumer

9.17.1. 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		ERC 8a, ERC 8d
Specific Environmental Release Category		ESVOC SpERC 8.11b.v1
Section 2		**Operational conditions and risk management measures**
Section 2.1		**Control of consumer exposure**
Product characteristics		
Physical form of product		liquid
Vapour pressure		950 Pa
Concentration of substance in product		Unless otherwise stated, cover concentrations up to 4.5% [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 4.5% [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, assumes swallowed amount of 0.3g [ConsOC13]; 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

PC27_n: Plant protection products--	OC	Unless otherwise stated, covers concentrations up to 4.5% [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, assumes swallowed amount of 0.3g [ConsOC13]; 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

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 8.11b.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/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
Conditions given in SPERC fact sheet (ESVOC SpERC 8.11b.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) [OOC7]	0.9
	Release fraction to wastewater from wide dispersive use [OOC8]	0.01
	Release fraction to soil from wide dispersive use (regional only) [OOC9]	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 93.67%. [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 93.67 (%) [STP3]
	Assumed domestic sewage treatment plant flow 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 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 as indicated in Appendix A.
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		*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*
4.2. Environment		
Environment sub-headings		*Confirm 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 sediment

	Msafe 4628 kg/day after RMM	
Site Use	0.01 ktonnes/year	
On-site emission factors	93.67 % 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		1.50E-03 mg/l

9.17.2. Exposure estimation

9.17.2.1. Workers exposure

Not applicable

9.17.2.2. Consumer exposure

The consumer exposure estimates for activities associated with the consumer use in agrochemicals of streams in the xylenes category were assessed using a toll based on the ECETOC TRAv2 (See Appendix A). Appendix A contains input tables used to model the consumer exposures. These tables contain all the operating conditions used to conduct the modelling and the default parameters of the model.

9.17.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.17.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.17.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.18. Exposure scenario 18: Use in Fuels of streams in the xylenes category - Industrial

9.18.1. Exposure scenario

Section 1 Exposure Scenario Title	
Title	Use in fuels of streams in the xylenes category
Sector of Use:	Industrial (SU3, SU10)
Use Descriptor	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**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].

Bulk transfers [CS14].

Contributing Scenarios	Risk Management Measures
	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].Avoid carrying out activities involving exposure for more than 1 hour [OC27].
General exposures (closed systems) [CS15].	No specific measures identified [EI18].
General exposures (closed systems) [CS15]. With occasional controlled exposure [CS137]	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
General exposures (closed systems) [CS15]. Batch process [CS55].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].

General exposures (open systems) [CS16]. ; (closed systems) [CS107]	No specific measures identified [EI18].
General exposures (open systems) [CS16]. ; (closed systems) [CS107]Batch process [CS55].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].
Equipment maintenance [CS5].	Drain down and flush system prior to equipment break-in or maintenance [E55].Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].
Vessel and container cleaning [CS103]	Provide extract ventilation to points where emissions occur [E54].
Storage [CS67]	No specific measures identified [EI18].
Storage [CS67]With occasional controlled exposure [CS137]	No specific measures identified [EI18].
Disposal of wastes [CS28].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].Avoid carrying out activities involving exposure for more than 1 hour [OC27].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 7.12a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/year
	Fraction of 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		
	Release fraction to air from process before RMMs	0.005
	Release fraction to waste water from process before RMMs	0.00001

	Release fraction to soil from process	0

	before RMMs	
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 >95%. [TCR 7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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	

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 sediment	
	Msafe 3639010 kg/day after RMM	
Site Use	5 ktonnes/year	
On-site emission factors	93.67 % 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		1.16E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.18.2. Exposure estimation

9.18.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in fuels of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the

efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.18.2.2. Consumer exposure

Not applicable.

9.18.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.18.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.18.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.19. Exposure scenario 19: Use in Fuels of streams in the xylenes category - Professional

9.19.1. Exposure scenario

Section 1 Exposure Scenario Title	
Title	Use in Fuels of streams in the xylenes category - Professional
Sector of Use:	Professional (SU22)
Use Descriptor	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**
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 daily exposures up to 8 hours (unless stated differently) [G2]
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 ºC above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Bulk transfers [CS14].	Provide a good standard of general or controlled ventilation (not less than 3 to 5 air changes per hour) [E11].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
Drum/batch transfers [CS8].	Provide a good standard of general or controlled ventilation (not less than 3 to 5 air changes per hour) [E11].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
Dipping, immersion and pouring [CS4].	Provide a good standard of general or controlled ventilation (not less than 3 to 5 air changes per hour) [E11].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].

General exposures (closed systems) [CS15].	No specific measures identified [EI18].
General exposures (closed systems) [CS15]. With occasional controlled exposure [CS137]	No specific measures identified [EI18]. Avoid carrying out activities involving exposure for more than 4 hours [OC 28].
General exposures (open systems) [CS16]. ; (closed systems) [CS107]Batch process [CS55].	Provide a good standard of general or controlled ventilation (not less than 3 to 5 air changes per hour) [E11].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
General exposures (open systems) [CS16]. ; (closed systems) [CS107]	No specific measures identified [EI18].
Equipment cleaning and maintenance [CS39].	Provide a good standard of general or controlled ventilation (not less than 3 to 5 air changes per hour) [E11].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
Vessel and container cleaning [CS103]	Provide a good standard of general or controlled ventilation (not less than 3 to 5 air changes per hour) [E11].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
Storage [CS67]	No specific measures identified [EI18].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 9.12b.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/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
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	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 93.67%. [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 93.67 (%) [STP3]
	Assumed domestic sewage treatment plant flow 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

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 sediment
	Msafe 0.22 kg/day after RMM
Site Use	0.0002 ktonnes/year
On-site emission factors	93.67 % 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		6.30E-04 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.19.2. Exposure estimation

9.19.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in fuels streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.19.2.2. Consumer exposure

Not applicable.

9.19.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.19.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.19.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.20. Exposure scenario 20: Use of streams in the xylenes category in fuels - Consumer

9.20.1. Exposure scenario

Section 1		**Exposure Scenario Title**
Title		**Covers consumer uses in liquid 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, ERC 9b
Specific Environmental Release Category		ESVOC SpERC 9.12c.v1
Section 2		**Operational conditions and risk management measures**
Section 2.1		**Control of consumer exposure**
Product characteristics		
Physical form of product		liquid
Vapour pressure		950 Pa
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 38% [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 37500g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m3[ConsOC11]; for each use event, covers exposure up to 0.05hr/event[ConsOC14];
	RMM	No specific RMMs developed beyong those OCs stated

PC13:Fuels--Liquid - subcategories added: Scooter Refuelling	OC	Unless otherwise stated, covers concentrations up to 38% [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 beyong those OCs stated
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 beyong those OCs stated
PC13:Fuels--Liquid (subcategories added): Garden Equipment - Refueling	OC	Unless otherwise stated, covers concentrations up to 38% [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 typcial 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 beyong those OCs stated
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 beyong those OCs stated

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 9.12c.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/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 93.67%. [TCR 11]	
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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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	

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 as indicated in Appendix A.
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		
		Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.
4.2. Environment		

Environment sub-headings		*Confirm 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 sediment	
	Msafe 0.22 kg/day after RMM	
Site Use	0.0002 ktonnes/year	
On-site emission factors	93.67 % 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		6.30E-04 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.20.2. Exposure estimation

9.20.2.1. Workers exposure

Not applicable

9.20.2.2. Consumer exposure

The consumer exposure estimates for activities associated with the consumer use in coatings of streams

in the xylenes category were assessed using a toll based on the ECETOC TRAv2 (See Appendix A). Appendix A contains input tables used to model the consumer exposures. These tables contain all the operating conditions used to conduct the modelling and the default parameters of the model.

9.20.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.20.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.20.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.21. Exposure scenario 21: Use in Polymer Production of streams in the xylenes category - Industrial

9.21.1. Exposure scenario

Section 1 Exposure Scenario Title	
Title	**Use in Polymer Production of streams in the xylenes category - Industrial**
Sector of Use:	Industrial (SU3, SU10)
Use Descriptor	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**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
General exposures (closed systems) [CS15]. Continuous process [CS54]. ; No sampling [CS57].	No specific measures identified [EI18].
Bulk transfers [CS14]. Transport [CS58]. ; With sample collection [CS56].	Ensure material transfers are under containment or extract ventilation [E66].
Polymerisation (bulk and batch) [CS65]Continuous process [CS54]. ; With sample collection [CS56].	No specific measures identified [EI18].

Polymerisation (bulk and batch) [CS65]Batch process [CS55]. ; With sample collection [CS56].	Provide a good standard of general or controlled ventilation (not less than 3 to 5 air changes per hour) [E11], or [G9], Ensure operation is undertaken outdoors [E69].
Finishing operations [CS102]Batch process [CS55]. ; With sample collection [CS56]. Catalyst inactivation and removal, washing and stripping / distillation to remove unreacted monomer	Provide a good standard of general or controlled ventilation (not less than 3 to 5 air changes per hour) [E11], or [G9], Ensure operation is undertaken outdoors [E69].
Intermediate polymer storage [CS66]	Provide a good standard of general or controlled ventilation (not less than 3 to 5 air changes per hour) [E11], or [G9], Ensure operation is undertaken outdoors [E69].
Additivation and stabilisation [CS69]	Provide extract ventilation to points where emissions occur [E54].
Mixing in containers [CS23].Batch process [CS55].	Provide extract ventilation to points where emissions occur [E54].
Pelletizing [CS53]. Extrusion and masterbatching [CS88]	Provide extract ventilation to points where emissions occur [E54]. Avoid carrying out activities involving exposure for more than 4 hours [OC 28]
Pelletizing [CS53].	Provide extract ventilation to points where emissions occur [E54].
Pelletisation and pellet screening [CS68](open systems) [CS108]	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Bulk transfers [CS14]. Continuous process [CS54]. ; With sample collection [CS56].	Provide a good standard of general or controlled ventilation (not less than 3 to 5 air changes per hour) [E11], or [G9], Ensure operation is undertaken outdoors [E69].
Transport [CS58]. With sample collection [CS56].	Ensure material transfers are under containment or extract ventilation [E66].
Equipment maintenance [CS5].	Drain down and flush system prior to equipment break-in or maintenance [E55].
Storage [CS67]With occasional controlled exposure [CS137]	No specific measures identified [EI18].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 4.21a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/year
	Fraction of 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
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	0.01
	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 93.67%. [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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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	

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 – Soil	
	Msafe 16835 kg/day after RMM	
Site Use	0.1 ktonnes/year	
On-site emission factors	93.67 % 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		6.30E-04 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.21.2. Exposure estimation

9.21.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in polymer production of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.21.2.2. Consumer exposure

Not applicable.

9.21.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.21.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.21.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.22. Exposure scenario 22: Use in Polymer Processing of streams in the xylenes category- Industrial

9.22.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in polymer processing of streams in the xylenes category
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
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**
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 > 20ºC above ambient [G15]. Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Bulk transfers [CS14]. (closed systems) [CS107].	Handle substance within a closed system [E47].
Bulk transfers [CS14]. (closed systems) [CS107]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].
Bulk transfers [CS14]. Dedicated facility [CS81].	Transfer via enclosed lines [E52].
Bulk weighing [CS91]. (closed systems) [CS107].	Handle substance within a closed system [E47].
Bulk weighing [CS91]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47].

Small scale weighing [CS90].	Ensure material transfers are under containment or extract

	ventilation [E66].
Additive premixing [CS92]. (closed systems) [CS107].	Ensure material transfers are under containment or extract ventilation [E66].
Additive premixing [CS92]. (open systems) [CS108]. With sample collection [CS56].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Additive premixing [CS92]. General exposures (open systems) [CS16].	Ensure material transfers are under containment or extract ventilation [E66].
Bulk transfers [CS14]. Drum/batch transfers [CS8].	Transfer via enclosed lines [E52].
Bulk transfers [CS14]. Small package filling [CS7].	Transfer via enclosed lines [E52].
Calendering (including Banburys) [CS64].	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 or controlled ventilation (10 to 15 air changes per hour) [E40].
Extrusion and masterbatching [CS88].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Injection moulding of articles [CS89].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Equipment maintenance [CS5].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67]. With occasional controlled exposure [CS137].	Store substance within a closed system [E84].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 4.21a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/year
	Fraction of 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 4.21a.v1) give rise to following releases fractions		

Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMMs	0.25
	Release fraction to waste water from process before RMMs	0
	Release fraction to soil from process before RMMs	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 93.67%. [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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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	

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of*

	efficiencies and OC.
4.2. Environment	*Confirm 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 – Soil	
	Msafe 2525253 kg/day after RMM	
Site Use	5 ktonnes/year	
On-site emission factors	93.67 % 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		6.30E-04 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.22.2. Exposure estimation

9.22.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in polymer processing of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.22.2.2. Consumer exposure

Not applicable.

9.22.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.22.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.22.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.23. Exposure scenario 23: Use in Polymer Processing of streams in the xylenes category - Professional

9.23.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in polymer processing of streams in the xylenes category
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC8a, PROC8b, PROC14, PROC21
	Environmental Release Categories: ERC 8A, ERC 8D
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**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa [OC5].
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**
Bulk transfers [CS14]. (closed systems) [CS107].	Handle substance within a closed system [E47].
Bulk transfers [CS14]. (closed systems) [CS107]. With occasional controlled exposure [CS137].	Handle substance within a closed system [E47]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Material transfers [CS3].	Transfer via enclosed lines [E52].
Injection moulding of articles [CS89].	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings [E60].
Rework of articles [CS86].	No specific measures identified [EI18].
Equipment maintenance [CS5].	Drain down system prior to equipment break-in or maintenance [E65]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11].
Storage [CS67].	Handle substance within a closed system [E47].No specific measures identified [EI18].

Storage [CS67]. With occasional controlled	Handle substance within a closed system [E47]. Provide a

exposure [CS137]	good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 8.21b.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	50 ktonnes/year
	Regional tonnage	5 ktonnes/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
Conditions given in SPERC fact sheet (ESVOC SpERC 8.21b.v1) give rise to following releases fractions		
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process before RMMs	0.98
	Release fraction to waste water from process before RMMs	0.01
	Release fraction to soil from process before RMMs	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 (or abatement?) efficiency of >0% [TCR7].	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [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 93.67 (%) [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 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, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 sediment	
	Msafe 4628 kg/day after RMM	
Site Use	0.01 ktonnes/year	
On-site emission factors	93.67 % 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	1.50E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.23.2. Exposure estimation

9.23.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in professional polymer processing streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.23.2.2. Consumer exposure

Not applicable.

9.23.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.23.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.23.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.24. Exposure scenario 24: Use in Functional fluids of streams in the xylenes category - Industrial

9.24.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in functional fluids of streams in the xylenes category
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**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Bulk transfers [CS14].	No specific measures identified [EI18].
Bulk transfers [CS14]. With occasional controlled exposure [CS137]	No specific measures identified [EI18].
Bulk transfers [CS14]. Batch process [CS55].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR; [G9], Ensure operation is undertaken outdoor [E69].
Bulk transfers [CS14].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR; [G9], Ensure operation is undertaken outdoor [E69].
Drum/batch transfers [CS8]. Dedicated facility [CS81].	Ensure material transfers are under containment or extract ventilation [E66].
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].	Use drum pumps or carefully pour from container [E64].
General exposures (closed systems) [CS15].	No specific measures identified [EI18].
General exposures (open systems) [CS16].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR; [G9], Ensure operation is undertaken outdoor [E69].
General exposures (open systems) [CS16].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR; [G9], Ensure operation is undertaken outdoor [E69].; Provide extract ventilation to points where emissions occur [E54].
Remanufacture of reject articles [CS19].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR; [G9], Ensure operation is undertaken outdoor [E69].; Provide extract ventilation to points where emissions occur [E54].
Equipment maintenance [CS5].	Drain down system prior to equipment break-in or maintenance [E65].
Storage [CS67]	No specific measures identified [EI18].
Storage [CS67]With occasional controlled exposure [CS137]	No specific measures identified [EI18].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 7.13a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/year
	Fraction of 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
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	0.005
	Release fraction to waste water from process	0.0003
	Release fraction to soil from process (regional only)	0.001
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 93.67%. [TCR 11]	
	Prevent discharge of undissolved substance to or recover from wastewater [TCR14].	
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 93.67 (%) [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 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, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 sediment	
	Msafe 89.13 kg/day after RMM	
Site Use	0.1 ktonnes/year	
On-site emission factors	93.67 % 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	9.46E-04 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.24.2. Exposure estimation

9.24.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in industrial functional fluids of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.24.2.2. Consumer exposure

Not applicable.

9.24.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.24.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.24.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.25. Exposure scenario 25: Use in Functional fluids of streams in the xylenes category - Professional

9.25.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in functional fluids of streams in the xylenes category
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**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Drum/batch transfers [CS8]. Non-dedicated facility [CS82].	Use drum pumps or carefully pour from container [E64].Avoid carrying out activities involving exposure for more than 4 hours [OC28].
Transfer from/pouring from containers [CS22].	Use drum pumps or carefully pour from container [E64].Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], OR; [G9], Ensure activity is undertaken outdoors [E69].
Filling / preparation of equipment from drums or containers. [CS45].	Use drum pumps or carefully pour from container [E64].Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], OR; [G9], Ensure activity is undertaken outdoors [E69].
General exposures (closed systems) [CS15].	No specific measures identified [EI18].
General exposures (open systems) [CS16]. At elevated temperature (product at 80oC)	Provide extract ventilation to points where emissions occur [E54].
Remanufacture of reject articles [CS19].	Drain down system prior to equipment break-in or maintenance [E65].Provide a good standard of general

	ventilation (not less than 3 to 5 air changes per hour). [E11], OR; [G9], Ensure activity is undertaken outdoors [E69].
Equipment maintenance [CS5]. Non-dedicated facility [CS82].	Drain down system prior to equipment break-in or maintenance [E65].Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], OR; [G9], Ensure activity is undertaken outdoors [E69].
Storage [CS67]With occasional controlled exposure [CS137]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], OR; [G9], Ensure activity is undertaken outdoors [E69].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 9.13b.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/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	0.05
	Release fraction to waste water from process	0.025
	Release fraction to soil from process (regional only)	0.025
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emissions to provide a typical removal (or abatement?) efficiency of >0% [TCR7].	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [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 93.67 (%) [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 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,*

	exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1 as indicated in Appendix A.

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 sediment	
	Msafe 0.21 kg/day after RMM	
Site Use	0.0002 ktonnes/year	
On-site emission factors	93.67 % 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		6.73E-04 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	

Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.25.2. Exposure estimation

9.25.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in professional functional fluids of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.25.2.2. Consumer exposure

Not applicable.

9.25.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.25.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.25.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.26. Exposure scenario 26: Use of streams in the xylenes category in functional fluids - Consumer

9.26.1. Exposure scenario

Section 1		**Exposure Scenario Title**
Title		**Use of sealed items containing functional fluids e.g. transfer oils, hydraulic fluids, refrigerants**
Sector of Use (SU code)		21
Use Descriptor (PC codes)		PC16, PC17
Processes, tasks, activities covered		Use of sealed items containing functional fluids e.g. transfer oils, hydraulic fluids, refrigerants
Environmental Release Category		ERC 9a, ERC 9b
Specific Environmental Release Category		ESVOC SpERC 9.13c.v1
Section 2		**Operational conditions and risk management measures**
Section 2.1		**Control of consumer exposure**
Product characteristics		
Physical form of product		liquid
Vapour pressure		950 Pa
Concentration of substance in product		Unless otherwise stated, cover concentrations up to 50% [ConsOC1]
Amounts used		Unless otherwise stated, covers use amounts up to 2200g [ConsOC2]; covers skin contact area up to 468cm^2 [ConsOC5]
Frequency and duration of use/exposure		Unless otherwise stated, covers use frequency up to 0.010958904109589 times per day [ConsOC4]; covers exposure up to 0.166666666666667 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**
PC16_n: Heat transfer fluids--Liquids	OC	Unless otherwise stated, covers concentrations up to 50% [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 typcial 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

PC17_n: Hydraulic fluids--Liquids	OC	Unless otherwise stated, covers concentrations up to 50% [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 typcial 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

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 9.13c.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/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	0.05
	Release fraction to waste water from process	0.025
	Release fraction to soil from process (regional only)	0.025
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 93.67%. [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 93.67 (%) [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 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, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1 as indicated in Appendix A.
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		*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*
4.2. Environment		
Environment sub-headings		*Confirm 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 sediment	
	Msafe 0.21 kg/day after RMM	
Site Use	0.0002 ktonnes/year	
On-site emission factors	93.67 % 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		6.73E-04 mg/l

9.26.2. Exposure estimation

9.26.2.1. Workers exposure

Not applicable

9.26.2.2. Consumer exposure

The consumer exposure estimates for activities associated with the consumer use in agrochemicals of streams in the xylenes category were assessed using a toll based on the ECETOC TRAv2 (See Appendix A). Appendix A contains input tables used to model the consumer exposures. These tables contain all the operating conditions used to conduct the modelling and the default parameters of the model.

9.26.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.26.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.26.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.27. Exposure scenario 27: Use in Oil Field Industry of streams in the xylenes category - Industrial

9.27.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in oil field drilling and production operations of streams in the xylenes category
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**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Bulk transfers [CS14].	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 activities involving expsoure for more than 1 hour [OC27].
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], or: [G9], Ensure operation is undertaken outdoors [E69].Avoid carrying out activities involving expsoure for more than 1 hour [OC27].
Drill floor operations [CS116].	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].
Drill floor operations [CS116].	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].
Operation of solids filtering equipment - vapour exposures [CS118].	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].
Operation of solids filtering equipment - aerosol exposures [CS119].	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].
Operation of solids filtering equipment [CS117].	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 activities involving expsoure for more than 1 hour [OC27].
Treatment and disposal of filtered solids [CS121].	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].
Process sampling [CS2].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR Ensure operation is undertaken outdoors [E69].
General exposures (closed systems) [CS15].	No specific measures identified [EI18].
Pouring from small containers [CS9].	Use drum pumps or carefully pour from container [E64].
General exposures (open systems) [CS16].	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].
Equipment cleaning and maintenance [CS39].	Use drum pumps or carefully pour from container [E64].
Batch process [CS55].	No specific measures identified [EI18].
Batch process [CS55]. With occasional controlled exposure [CS137]	No specific measures identified [EI18].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 4.5a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/year
	Fraction of main local source	2.00E-03
Frequency and duration of use	Emission days per year	300
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	*Not applicable*
	Local marine water dilution factor	*Not applicable*
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	*Not applicable*
	Release fraction to waste water from process	*Not applicable*
	Release fraction to soil from process (regional only)	*Not applicable*
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	*Not applicable*	

Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other environmental control measures additional to above	*Not applicable*
Basis for scaling	*Not applicable*

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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.*

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	

Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.27.2. Exposure estimation

9.27.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in industrial oil fields of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.27.2.2. Consumer exposure

Not applicable.

9.27.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.27.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.27.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.28. Exposure scenario 28: Use in Oil Field Industry of streams in the xylenes category - Professional

9.28.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in oil field drilling and production operations of streams in the xylenes category
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b
	Environmental Release Categories: ERC8D
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**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Bulk transfers [CS14].	Transfer via enclosed lines [E52].
Filling / preparation of equipment from drums or containers. [CS45].	Transfer via enclosed lines [E52].
Drill floor operations [CS116].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR Ensure operation is undertaken outdoors [E69].
Drill floor operations [CS116].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 1 hour [OC27]
Operation of solids filtering equipment - vapour exposures [CS118].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].
Operation of solids filtering equipment - aerosol exposures [CS119].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].

Operation of solids filtering equipment [CS117].	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40].Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Treatment and disposal of filtered solids [CS121].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR Ensure operation is undertaken outdoors [E69].
Process sampling [CS2].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR Ensure operation is undertaken outdoors [E69].
General exposures (closed systems) [CS15].	No specific measures identified [EI18].
Pouring from small containers [CS9].	Use drum pumps or carefully pour from container [E64].Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR Ensure operation is undertaken outdoors [E69].
General exposures (open systems) [CS16].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Equipment cleaning and maintenance [CS39].	Drain down and flush system prior to equipment break-in or maintenance [E55].
Batch process [CS55].	No specific measures identified [EI18].
Batch process [CS55]. With occasional controlled exposure [CS137]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11]. OR Ensure operation is undertaken outdoors [E69]. No specific measures identified [EI18].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 4.5a.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/year
	Fraction of main local source	*Not applicable*
Frequency and duration of use	Emission days per year	*Not applicable*
Environmental Factors not influenced by risk management	Local Freshwater dilution factor	*Not applicable*
	Local marine water dilution factor	*Not applicable*
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	*Not applicable*
	Release fraction to waste water from process	*Not applicable*
	Release fraction to soil from process (regional only)	*Not applicable*
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	*Not applicable*	

Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other environmental control measures additional to above	*Not applicable*
Basis for scaling	*Not applicable*

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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.*

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	

Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.28.2. Exposure estimation

9.28.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in Oil Field Industry of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.28.2.2. Consumer exposure

Not applicable.

9.28.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.28.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.28.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.29. Exposure scenario 29: Use in Road Construction of streams in the xylenes category - Professional

9.29.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in road and construction appliances of streams in the xylenes category
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13
	Environmental Release Categories: ERC 8D & 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**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Drum/batch transfers [CS8]. ; Non-dedicated facility [CS82]	Use drum pumps or carefully pour from container [E64].Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], OR: [G9] Ensure activity is undertaken outdoors [E69].
Drum/batch transfers [CS8]. ; Dedicated facility [CS81]	Ensure material transfers are under containment or extract ventilation [E66]. ; Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], OR: [G9] Ensure activity is undertaken outdoors [E69].
Manual roller application or brushing [CS13].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], OR: [G9] Ensure activity is undertaken outdoors [E69].Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Spraying/fogging by machine application [CS25].	Ensure operation is undertaken outdoors [E69]. ; Provide extract ventilation to points where emissions occur [E54], OR; [G9], Operate away from sources of substance

	emission or release [E77]. Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Dipping, immersion and pouring [CS4].	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], OR: [G9] Ensure activity is undertaken outdoors [E69].Wear a respirator conforming to EN140 with Type A filter or better. [PPE22]
Equipment cleaning and maintenance [CS39].	Drain down and flush system prior to equipment break-in or maintenance [E55].Provide extract ventilation to points where emissions occur [E54], OR; [G9], Operate away from sources of substance emission or release [E77]. Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].
Storage [CS67]	No specific measures identified [EI18].
Storage [CS67]With occasional controlled exposure [CS137]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11], OR: [G9] Ensure activity is undertaken outdoors [E69].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 8.15.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/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	0.95
	Release fraction to waste water from process	0.01
	Release fraction to soil from process (regional only)	0.04
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Treat air emissions to provide a typical removal (or abatement?) efficiency of >0% [TCR7].	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [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 93.67 (%) [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 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, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 sediment	
	Msafe 0.21 kg/day after RMM	
Site Use	0.0002 ktonnes/year	
On-site emission factors	93.67 % 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		6.47E-04 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.29.2. Exposure estimation

9.29.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in road construction of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.29.2.2. Consumer exposure

Not applicable.

9.29.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.29.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.29.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.30. Exposure scenario 30: Use in Laboratory applications of streams in the xylenes category - Industrial

9.30.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in laboratory reagents of streams in the xylenes category
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**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
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 equiment, 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	EUSES 2.1.1 using default relase fractions from propose to assess using ERCs	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/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	0.025
	Release fraction to waste water from process	0.02
	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 emission to provide a typical removal efficiency of >0% [TCR7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [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 93.67 (%) [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 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, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 – Soil	
	Msafe 3 kg/day after RMM	
Site Use	0.1 ktonnes/year	
On-site emission factors	93.67 % 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		2.17E-02 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.30.2. Exposure estimation

9.30.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in industrial laboratory applications of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table

(also in Appendix A) contains the associated RMMs.

9.30.2.2. Consumer exposure

Not applicable.

9.30.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.30.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.30.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.31. Exposure scenario 31: Use in Laboratory Applications of the Xylenes Category - Professional

9.31.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	**Use in laboratory reagents of streams in the xylenes category**
Use Descriptor	Sector of Use: Professional (SU22)
	Process Categories: PROC10, PROC15
	Environmental Release Categories: ERC 4
Processes, tasks, activities covered	Use of small quantities within laboratory settings, including material transfers and equipment cleaning.
Section 2	**Operational conditions and risk management measures**
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].
Contributing Scenarios	**Risk Management Measures**
Laboratory activities [CS36]. Small scale [CS61]. Fume-cupboard Activity [CS139].	No specific measures identified [EI18].
Cleaning [CS47]. Rolling, Brushing [CS51]. ; Vessel and container cleaning [CS103]	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). [E11].; Handle in a fume cupboard or under extract ventilation [E83].

Section 2.2	**Control of environmental exposure**

Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 8.17.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/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	0.5
	Release fraction to waste water from process	0.5
	Release fraction to soil from process (regional only)	0
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% [TCR7]	
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [TCR 11]	
	Soil emission controls are not applicable as there is no direct release to soil. [TCR4]	
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. [OMS2]	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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 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 as indicated in Appendix A.*
	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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*
4.2. Environment	*Confirm that RMMs and OCs are as described or of equivalent efficiency. The required efficiency removal from water is 93.57% 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 sediment	
	Msafe 0.09 kg/day after RMM	
Site Use	0.0002 ktonnes/year	
On-site emission factors	93.67 % 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		1.50E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	*Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.*
Control of environmental exposure	
Selection of relevant RMM Core Phrases	*Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.*

9.31.2. Exposure estimation

9.31.2.1. Workers exposure

The worker exposure estimates for the activities associated with the professional use in laboratory

applications for the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.31.2.2. Consumer exposure

Not applicable.

9.31.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.31.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.31.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.32. Exposure scenario 32: Use in Explosives of streams in the xylenes category - Industrial

9.32.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in explosive manufacture and use of streams in the xylenes category
Use Descriptor	Sector of Use: Industrial (SU3, SU8, SU9)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15
	Environmental Release Categories: ERC2
Processes, tasks, activities covered	Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning.
Section 2	**Operational conditions and risk management measures**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Bulk transfers [CS14]. 1-4 hours, ambient temp.	Provide a good standard of controlled ventilation (not less than 3 to 5 air changes per hour) [E11]; OR [G9] Ensure activity is undertaken outdoors [E69].
Drum/batch transfers [CS8]. 1-4 hours, ambient temp.	Provide a good standard of controlled ventilation (not less than 3 to 5 air changes per hour) [E11]; OR [G9] Ensure activity is undertaken outdoors [E69].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
Mixing in containers [CS23].; (closed systems) [CS107]1-4 hours, ambient temp.	Provide a good standard of controlled ventilation (not less than 3 to 5 air changes per hour) [E11]; OR [G9] Ensure activity is undertaken outdoors [E69].
Mixing in containers [CS23].; (closed systems) [CS107]1-4 hours, ambient temp.	Provide a good standard of controlled ventilation (not less than 3 to 5 air changes per hour) [E11]; OR [G9] Ensure activity is undertaken outdoors [E69].
Mixing in containers [CS23].; (open systems) [CS108]1-4 hours, ambient temp.	Provide extract ventilation to points where emissions occur [E54]. Avoid carrying out activities involving exposure for more than 4 hours [OC 28].

Material transfers [CS3]. <1 hours, ambient temp.	Provide a good standard of controlled ventilation (not less than 3 to 5 air changes per hour) [E11]; OR [G9] Ensure activity is undertaken outdoors [E69].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
Transfer from/pouring from containers [CS22]. ; Non-dedicated facility [CS82]<1 hours, ambient temp.	Use drum pumps [E53].Provide a good standard of controlled ventilation (not less than 3 to 5 air changes per hour) [E11]; OR [G9] Ensure activity is undertaken outdoors [E69].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
Clean down and maintenance [CS26].	Provide a good standard of controlled ventilation (not less than 3 to 5 air changes per hour) [E11]; OR [G9] Ensure activity is undertaken outdoors [E69].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
Equipment maintenance [CS5].	Drain down system prior to equipment break-in or maintenance [E65].Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour) [E40].
Storage [CS67] daily; ambient temp.	Ensure operation is undertaken outdoors [E69].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 2.18.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/year
	Fraction of 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
Other Operational Conditions of use affecting environmental exposure	Release fraction to air from process	0.0005
	Release fraction to waste water from process	0.0003
	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 93.67%. [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 93.67 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 sediment	
	Msafe 89.13 kg/day after RMM	
Site Use	0.1 ktonnes/year	
On-site emission factors	93.67 % efficiency water, 80 % 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		9.46E-04 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.32.2. Exposure estimation

9.32.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in explosives of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.32.2.2. Consumer exposure

Not applicable.

9.32.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.32.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.32.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.33. Exposure scenario 33: Use in Rubber manufacture of streams in the xylenes category - Industrial

9.33.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in rubber manufacture of streams in the xylenes category
Use Descriptor	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC13, PROC14, PROC21
	Environmental Release Categories: ERC1, ERC4, ERC6D
	Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing.
Processes, tasks, activities covered	Sector of Use: Industrial (SU10)
Section 2	**Operational conditions and risk management measures**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Material transfers [CS3].	No specific measures identified [EI18].
Material transfers [CS3]. With occasional controlled exposure [CS137]	No specific measures identified [EI18].
Material transfers [CS3]. Dedicated facility [CS81].Large Containers	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 activities involving exposure for more than 1 hour [OC27].
Bulk weighing [CS91](closed systems) [CS107].	No specific measures identified [EI18].
Bulk weighing [CS91]With occasional controlled exposure [CS137]	No specific measures identified [EI18].
Small scale weighing [CS90]Dedicated facility [CS81].	Ensure material transfers are under containment or extract ventilation [E66].

Additive premixing [CS92]Batch process [CS55]. ; (closed systems) [CS107].	Provide extract ventilation to material transfer points and other openings [E82].
Additive premixing [CS92]	Provide extract ventilation to points where emissions occur [E54].
Material transfers [CS3]. Dedicated facility [CS81].	Ensure material transfers are under containment or extract ventilation [E66]. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour) [E40].
Material transfers [CS3]. Small Containers	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]. ; Provide extract ventilation to points where emissions occur [E54].
Additive premixing [CS92]Mixing operations (open systems) [CS30].	Provide extract ventilation to points where emissions occur [E54].
Calendering (including Banburys) [CS64]	Restrict area of openings to equipment [E68].Provide extract ventilation to points where emissions occur [E54].
Calendering (including Banburys) [CS64]	Restrict area of openings to equipment [E68].Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11]Avoid carrying out activities involving exposure for more than 1 hour [OC27].
Pressing uncured rubber blanks [CS73]	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) [E40].
Vulcanisation [CS70]	Restrict area of openings to equipment [E68].Provide extract ventilation to points where emissions occur [E54].
Cooling cured articles [CS71]	Provide extract ventilation to points where emissions occur [E54].
Laboratory activities [CS36].	Handle in a fume cupboard or under extract ventilation [E83].
Equipment maintenance [CS5].	Drain or remove substance from equipment prior to break-in or maintenance [E81].Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 4.19.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/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	0.01
	Release fraction to waste water from process	0.003
	Release fraction to soil from process (regional only)	0.0001

Technical onsite conditions and	Treat air emissions to provide a typical removal efficiency of >0%. [TCR

measures to reduce or limit discharges, air emissions and releases to soil	8]
	Typical onsite wastewater treatment technology provides removal efficiency of 93.67%. [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 93.67 (%) [STP3]
	Assumed domestic sewage treatment plant flow 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

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 – Soil	
	Msafe 17 kg/day after RMM	
Site Use	0.1 ktonnes/year	
On-site emission factors	93.67 % 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		3.79E-03 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.33.2. Exposure estimation

9.33.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in industrial rubber production of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.33.2.2. Consumer exposure

Not applicable.

9.33.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1.

The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.33.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.33.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.34. Exposure scenario 34: Use in Mining chemicals of streams in the xylenes category - Industrial

9.34.1. Exposure scenario

Section 1	**Exposure Scenario Title**
Title	Use in mining chemicals of streams in the xylenes category
Use Descriptor	Sector of Use: Industrial (SU3, SU8, SU9)
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8b, PROC9
	Environmental Release Categories: ERC4
Processes, tasks, activities covered	Covers the use of the substance in extraction processes at mining operations, including material transfers, winning and separation activities, and substance recovery and disposal.
Section 2	**Operational conditions and risk management measures**
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 [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	**Risk Management Measures**
Bulk transfers [CS14]. With occasional controlled exposure [CS137]	No specific measures identified [EI18].
Drum/batch transfers [CS8]. Dedicated facility [CS81].	Use drum pumps [E53].
Pouring from small containers [CS9].	Provide a good standard of controlled ventilation (not less than 3 to 15 air changes per hour) [E11].Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
General exposures (closed systems) [CS15]. Batch process [CS55].	Provide a good standard of controlled ventilation (not less than 3 to 15 air changes per hour) [E11], OR; [G9], Ensure operation is undertaken outdoors [E69].
General exposures (open systems) [CS16].	Provide extract ventilation to points where emissions occur [E54].
phase separation [CS106]; (closed systems) [CS107]	Provide a good standard of controlled ventilation (not less than 3 to 15 air changes per hour) [E11], OR; [G9], Ensure operation is undertaken outdoors [E69].

Ion exchange processes [CS105]; (closed systems) [CS107]With occasional controlled exposure [CS137]	No specific measures identified [EI18].
Process sampling [CS2]. Batch process [CS55]. ; (closed systems) [CS107].	Provide a good standard of controlled ventilation (not less than 3 to 15 air changes per hour) [E11], OR; [G9], Ensure operation is undertaken outdoors [E69].
Mixing in containers [CS23].; (closed systems) [CS107]	No specific measures identified [EI18].
Equipment cleaning and maintenance [CS39]. Non-dedicated facility [CS82].	Provide a good standard of controlled ventilation (not less than 3 to 15 air changes per hour) [E11], OR; [G9], Ensure operation is undertaken outdoors [E69]. Avoid carrying out activities involving exposure for more than 1 hour [OC 27].
General exposures (closed systems) [CS15].	No specific measures identified [EI18].
General exposures (closed systems) [CS15]. With occasional controlled exposure [CS137]	No specific measures identified [EI18].
Storage [CS67]	No specific measures identified [EI18].

Section 2.2	**Control of environmental exposure**	
Assessment method	EUSES 2.1.1 using default relase fractions from ESVOC SpERC 4.19.v1	
Product characteristics	The Xylenes category consists of liquids of medium volatility. The water solubility for the category is 166mg/l; the vapour pressure is 821 Pa at 20°C; and the log Kow is 3.16 and is readily biodegradable	
Amounts Used	EU tonnage	1 ktonnes/year
	Regional tonnage	0.1 ktonnes/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	0.25
	Release fraction to waste water from process	0.5
	Release fraction to soil from process (regional only)	0.05
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 93.67%. [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].	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment 93.57 (%) [STP3]	
	Assumed domestic sewage treatment plant flow 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

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 as indicated in Appendix A.*

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	*Confirm that RMMs and OCs are as described or of equivalent efficiency. See Appendix A for details of efficiencies and OC.*

4.2. Environment	*Confirm 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 – Soil	
	Msafe 0.1 kg/day after RMM	
Site Use	0.025 ktonnes/year	
On-site emission factors	93.67 % efficiency water, 80 % 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	1.32E-01 mg/l

Section 5	**Additional good practice advice beyond the REACH Chemical Safety Assessment**
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Selection of relevant Contributing Scenario phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

9.34.2. Exposure estimation

9.34.2.1. Workers exposure

The worker exposure estimates for the activities associated with the use in industrial mining chemicals of streams in the xylenes category were assessed using ECETOC TRAv2 (See Appendix A). Appendix A contains Tables 1 and 2 used to model the worker exposures. These tables contain all the operating conditions, and the efficiencies of the exposure modifiers including RPE, PPE and LEV. A separate table (also in Appendix A) contains the associated RMMs.

9.34.2.2. Consumer exposure

Not applicable.

9.34.2.3. Indirect exposure of humans via the environment

The estimation of indirect human exposure via the environment was conducted using EUSES v2.1.1. The total daily intakes from exposure via the local environmental are presented in Appendix B.

9.34.2.4. Environmental exposure

The PECs are based on the factors shown in Section 2.2 of 9.34.1 Exposure Scenario: See Appendix B for local PECs and local environmental releases.

For regional PECs see section 9.35.

9.35 Regional Exposure Concentrations

	Compartments				
Air (mg m^{-3})	**Fresh water (mg l^{-1})**	**Marine water (mg l^{-1})**	**Fresh water Sediment**	**Marine water Sediment**	**Soil (mg kg^{-1} wwt) (agricultural)**

			(mg kg^{-1} wwt)	(mg kg^{-1} wwt)	
1.03E-02	1.23E-03	1.03E-04	1.30E-02	9.62E-04	6.00E-04