BYK-P 104 S

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

1.1 Product identifier

Trade name : BYK-P 104 S

Product code : 000000000000105747

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

Use of the Substance/Mixture : Wetting & Dispersing Additive

1.3 Details of the supplier of the safety data sheet

Company : BYK-Chemie GmbH
Abelstrasse 45
46483 Wesel
Telephone : +49 281 670-0
Telefax : +49 281 65735

Information : Regulatory Affairs
Telephone : +49 281 670-23532
Telefax : +49 281 670-23533
E-mail address : GHS.BYK@altana.com

1.4 Emergency telephone number

+44 1235 239670

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids, Category 3	H226: Flammable liquid and vapour.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Specific target organ toxicity - single exposure, Category 3, Respiratory system	H335: May cause respiratory irritation.
Specific target organ toxicity - repeated exposure, Category 2	H373: May cause damage to organs through prolonged or repeated exposure.
Long-term (chronic) aquatic hazard, Category 3	H412: Harmful to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Warning

Hazard statements :

H226	Flammable liquid and vapour.
H317	May cause an allergic skin reaction.
H335	May cause respiratory irritation.
H373	May cause damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe mist or vapours.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Hazardous components which must be listed on the label:

- 85711-46-2 Fatty acids, C14-18 and C16-18-unsatd., maleated
- 1330-20-7 Xylene, mixture of isomers
- 108-31-6 maleic anhydride

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Solution of a lower molecular weight unsaturated polycarboxylic acid polymer and a polysiloxane copolymer

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Fatty acids, C14-18 and C16-18-unsatd., maleated	85711-46-2 01-2119976378-19-0000	Skin Irrit. 2; H315 Skin Sens. 1; H317	>= 30 - < 50
Xylene, mixture of isomers	1330-20-7 01-2119488216-32	Eye Irrit. 2; H319 STOT SE 3; H335 (Respiratory system) STOT RE 2; H373 Asp. Tox. 1; H304 Flam. Liq. 3; H226 Acute Tox. 4; H332 Acute Tox. 4; H312 Skin Irrit. 2; H315 Aquatic Chronic 3; H412	>= 30 - < 50
ethylbenzene	100-41-4 202-849-4	Flam. Liq. 2; H225 Acute Tox. 4; H332 STOT RE 2; H373 (hearing organs) Asp. Tox. 1; H304 Aquatic Chronic 3; H412	>= 12,5 - < 20
2,6-dimethylheptan-4-one	108-83-8 203-620-1 01-2119474441-41	Flam. Liq. 3; H226 STOT SE 3; H335 (Respiratory system) ——————— specific concentration limit STOT SE 3; H335 >= 10 % STOT SE 3; H335 >= 10 %	>= 3 - < 5
maleic anhydride	108-31-6 203-571-6 01-2119472428-31	Acute Tox. 4; H302 Skin Corr. 1B; H314 Eye Dam. 1; H318 Resp. Sens. 1; H334 Skin Sens. 1A; H317 STOT RE 1; H372 (Respiratory system) EUH071	>= 0,25 - < 0,5

		specific concentration limit Skin Sens. 1A; H317 >= 0,001 % Skin Sens. 1A; H317 >= 0,001 % Acute toxicity estimate Acute oral toxicity: 1.090 mg/kg	
octamethylcyclotetrasiloxane [D4]	556-67-2 209-136-7 01-2119529238-36	Repr. 2; H361f Aquatic Chronic 1; H410 PBT; EUH440 vPvB; EUH441 Flam. Liq. 3; H226 M-Factor (Chronic aquatic toxicity): 1010	>= 0,025 - < 0,1

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact : If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Flush eyes with water as a precaution.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.

Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : No information available.

Risks : May cause an allergic skin reaction.
May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : No information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media : High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : Carbon oxides

5.3 Advice for firefighters

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
For safety reasons in case of fire, cans should be stored separately in closed containments.
Use a water spray to cool fully closed containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Remove all sources of ignition.

Evacuate personnel to safe areas.
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Neutralize with chalk, alkali solution or ammonia.
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections

For disposal considerations see section 13., For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid formation of aerosol.
Do not breathe vapours/dust.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Take precautionary measures against static discharges.
Provide sufficient air exchange and/or exhaust in work rooms.
Open drum carefully as content may be under pressure.
Dispose of rinse water in accordance with local and national regulations.
Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material.
Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Keep away from open flames, hot surfaces and sources of ignition.

Hygiene measures : When using do not eat or drink. When using do not smoke.
Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Electrical installations / working materials must comply with the technological safety standards.

Further information on storage stability : No decomposition if stored and applied as directed.

7.3 Specific end use(s)

Specific use(s) : No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Xylene, mixture of isomers	1330-20-7	TWA	50 ppm 221 mg/m3	2000/39/EC
	Further information: Identifies the possibility of significant uptake through the skin, Indicative			
		STEL	100 ppm 442 mg/m3	2000/39/EC
	Further information: Identifies the possibility of significant uptake through the skin, Indicative			
		TWA	50 ppm 220 mg/m3	GB EH40
	Further information: Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.			
		STEL	100 ppm 441 mg/m3	GB EH40
	Further information: Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.			
ethylbenzene	100-41-4	TWA	100 ppm 442 mg/m3	2000/39/EC
	Further information: Identifies the possibility of significant uptake through the skin, Indicative			
		STEL	200 ppm 884 mg/m3	2000/39/EC
	Further information: Identifies the possibility of significant uptake through the skin, Indicative			
		TWA	100 ppm 441 mg/m3	GB EH40
	Further information: Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.			
		STEL	125 ppm 552 mg/m3	GB EH40
	Further information: Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will			

	lead to systemic toxicity.			
2,6-dimethylheptan-4-one	108-83-8	TWA	25 ppm 148 mg/m3	GB EH40
maleic anhydride	108-31-6	TWA	1 mg/m3	GB EH40
	Further information: Capable of causing occupational asthma.			
		STEL	3 mg/m3	GB EH40
	Further information: Capable of causing occupational asthma.			

Biological occupational exposure limits

Substance name	CAS-No.	Control parameters	Sampling time	Basis
Xylene, mixture of isomers	1330-20-7	methyl hippuric acid: 650 Millimoles per mole creatinine (Urine)	After shift	GB EH40 BAT

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006

Substance name	End Use	Exposure routes	Potential health effects	Value
Xylene, mixture of isomers	Workers	Inhalation	Long-term systemic effects	221 mg/m3
	Workers	Inhalation	Acute local effects	442 mg/m3
	Workers	Dermal	Long-term systemic effects	212 mg/kg
	Consumers	Inhalation	Long-term systemic effects	65,3 mg/m3
	Consumers	Dermal	Long-term systemic effects	125 mg/kg
	Consumers	Oral	Long-term systemic effects	1,5 mg/kg
	Consumers	Inhalation	Acute local effects	260 mg/m3
2,6-dimethylheptan-4-one	Workers	Inhalation	Acute systemic effects, Acute local effects, Long-term local effects	290 mg/m3
	Workers	Skin contact	Long-term systemic effects	80 mg/kg
	Workers	Inhalation	Long-term systemic effects	479 mg/m3
	Consumers	Inhalation	Acute systemic effects, Acute local effects, Long-term local effects	145 mg/m3
	Consumers	Skin contact	Long-term systemic effects	28,5 mg/kg
	Consumers	Inhalation	Long-term systemic effects	171 mg/kg
	Consumers	Ingestion	Long-term systemic effects	7,14 mg/kg
maleic anhydride	Workers	Inhalation	Long-term systemic effects, Long-term	0,081 mg/m3

			local effects	
	Workers	Inhalation	Systemic effects, Acute effects, Local effects	0,2 mg/m3
octamethylcyclotetrasiloxane [D4]	Consumers	Oral	Acute systemic effects, Long-term systemic effects	3,7 mg/kg
	Consumers	Inhalation	Acute systemic effects, Acute local effects, Long-term systemic effects, Long-term local effects	13 mg/m3
	Workers	Inhalation	Acute systemic effects, Acute local effects, Long-term systemic effects, Long-term local effects	73 mg/m3

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Substance name	Environmental Compartment	Value
Xylene, mixture of isomers	Fresh water	0,327 mg/l
	Marine water	0,327 mg/l
	Fresh water sediment	12,46 mg/kg
	Marine sediment	12,46 mg/kg
	Soil	2,31 mg/kg
	Sewage treatment plant	6,58 mg/l
	Intermittent releases	0,327 mg/l
2,6-dimethylheptan-4-one	Fresh water	0,03 mg/l
	Marine water	0,003 mg/l
	Intermittent releases	0,3 mg/l
	Fresh water sediment	0,46 mg/kg
	Marine sediment	0,046 mg/kg
	Sewage treatment plant	2,55 mg/l
	Soil	0,0746 mg/kg
maleic anhydride	Fresh water	0,038 mg/l
	Marine water	0,0038 mg/l
	Intermittent releases	0,379 mg/l
	Soil	0,037 mg/kg
	Fresh water sediment	0,296 mg/kg
	Marine sediment	0,0296 mg/kg
	Sewage treatment plant	44,6 mg/l
octamethylcyclotetrasiloxane [D4]	Fresh water	1,5 µg/l
	Marine water	0,15 µg/l
	Fresh water sediment	0,64 mg/kg
	Soil	0,84 mg/kg
	Sewage treatment plant	10 mg/l
	Marine sediment	0,064 mg/kg
	Hazard for predators: secondary poisoning	41 mg/kg

8.2 Exposure controls

Personal protective equipment

Eye/face protection	:	Eye wash bottle with pure water Tightly fitting safety goggles
Hand protection		
Material	:	Fluorinated rubber
Break through time	:	> 480 min
Glove thickness	:	> 0,45 mm
Remarks	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Respiratory protection	:	In the case of vapour formation use a respirator with an approved filter.

Environmental exposure controls

General advice	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	light brown
Odour	:	aromatic
Odour Threshold	:	No data available
Melting point/ range	:	< 0 °C Method: derived
Initial boiling point	:	137,00 °C Method: derived
Upper explosion limit / Upper flammability limit	:	7,60 %(V)
Lower explosion limit / Lower flammability limit	:	0,80 %(V)
Flash point	:	28,00 °C Method: 48 (Abel-Pensky) DIN 51755

Auto-ignition temperature	:	> 200 °C Method: DIN 51794
Decomposition temperature	:	No data available
pH	:	4 (20 °C) Concentration: 1 % Method: Universal pH-value indicator
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	40 mm2/s (40,00 °C)
Solubility(ies)		
Water solubility	:	immiscible
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Vapour pressure	:	9 hPa (20,00 °C) Method: derived
Relative density	:	No data available
Density	:	0,9450 g/cm3 (20,00 °C) Method: 4 (20°C oscillating U-tube)
Relative vapour density	:	No data available

9.2 Other information

Flammability (liquids)	:	Sustains combustion
Evaporation rate	:	No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	No decomposition if stored and applied as directed. Vapours may form explosive mixture with air.

10.4 Conditions to avoid

Conditions to avoid : Heat, flames and sparks.

10.5 Incompatible materials

Materials to avoid : Strong oxidizing agents
Strong acids

10.6 Hazardous decomposition products

No decomposition if stored normally.

SECTION 11: Toxicological information

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

Acute toxicity

Not classified due to lack of data.

Product:

Acute oral toxicity : LD50 (Rat, male and female): > 3.500,000000 mg/kg
Method: OECD Test Guideline 401
GLP: yes

Acute inhalation toxicity : Acute toxicity estimate: > 20 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: > 2.000 mg/kg
Method: Calculation method

Components:

Fatty acids, C14-18 and C16-18-unsatd., maleated:

Acute oral toxicity : LD50 (Rat, female): > 2.000 mg/kg
Method: OECD Test Guideline 423
GLP: yes

Xylene, mixture of isomers:

Acute oral toxicity : LD50 (Rat): 4.300 mg/kg
Method: EC Directive 92/69/EEC B.1 Acute Toxicity (Oral)
GLP: no

Acute dermal toxicity : LD50 (Rabbit): > 4.200 mg/kg
GLP: No information available.

2,6-dimethylheptan-4-one:

Acute oral toxicity : LD50 (Rat): > 2.000 mg/kg
Method: OECD Test Guideline 401
GLP: yes

Acute inhalation toxicity	:	LC50 (Rat): > 14 mg/l Test atmosphere: dust/mist Method: OECD Test Guideline 403 GLP: no
Acute dermal toxicity	:	LD50 (Rat): > 2.000 mg/kg Method: OECD Test Guideline 402 GLP: yes

maleic anhydride:

Acute oral toxicity	:	LD50 (Rat, male and female): 1.090 mg/kg Method: OECD Test Guideline 401
Acute dermal toxicity	:	LD50 (Rabbit, female): 2.620 mg/kg GLP: No information available.

Skin corrosion/irritation

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

Product:

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	No skin irritation
Remarks	:	May cause skin irritation and/or dermatitis.

Components:

Fatty acids, C14-18 and C16-18-unsatd., maleated:

Species	:	EPISKIN human epidermis skin constructs
Assessment	:	Irritating to skin.
Method	:	OECD Test Guideline 439
Result	:	Irritating to skin.
GLP	:	yes

2,6-dimethylheptan-4-one:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation
GLP	:	yes

maleic anhydride:

Species	:	Rabbit
Method	:	No information available.
Result	:	Corrosive to skin
GLP	:	no

Serious eye damage/eye irritation

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

Product:

Species	:	Rabbit
Assessment	:	No eye irritation
Method	:	OECD Test Guideline 405
Result	:	No eye irritation
Remarks	:	Vapours may cause irritation to the eyes, respiratory system and the skin.

Components:

Fatty acids, C14-18 and C16-18-unsatd., maleated:

Species	:	Rabbit
Method	:	OECD Test Guideline 405
Result	:	No eye irritation
GLP	:	yes

2,6-dimethylheptan-4-one:

Species	:	Rabbit
Method	:	OECD Test Guideline 405
Result	:	No eye irritation
GLP	:	no

maleic anhydride:

Species	:	Rabbit
Result	:	Corrosive to eyes
GLP	:	yes

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified due to lack of data.

Product:

Remarks	:	Causes sensitisation.

Components:

Fatty acids, C14-18 and C16-18-unsatd., maleated:

Test Type	:	Mouse Local Lymph Node assay (LLNA)
Species	:	Mouse
Assessment	:	May cause sensitisation by skin contact.
Method	:	OECD Test Guideline 429
Result	:	May cause sensitisation by skin contact.

GLP : yes

2,6-dimethylheptan-4-one:

Test Type	:	Maximisation Test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Not a skin sensitizer.
GLP	:	yes

maleic anhydride:

Test Type	:	Buehler Test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Causes sensitisation.
GLP	:	yes

octamethylcyclotetrasiloxane [D4]:

Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitisation.
GLP	:	yes

Germ cell mutagenicity

Not classified due to lack of data.

Product:

Genotoxicity in vitro : Remarks: No data available

Genotoxicity in vivo : Remarks: No data available

Components:

Fatty acids, C14-18 and C16-18-unsatd., maleated:

Genotoxicity in vitro : Test Type: Ames test
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

Test Type: In vitro mammalian cell gene mutation test (mouse lymphoma)

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476

Result: negative
GLP: yes

Test Type: Chromosome aberration test in vitro
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
GLP: yes

Carcinogenicity

Not classified due to lack of data.

Product:

Remarks : No data available

Reproductive toxicity

Not classified due to lack of data.

Product:

Effects on fertility : Remarks: No data available

Effects on foetal development : Remarks: No data available

STOT - single exposure

May cause respiratory irritation.

Product:

Remarks : No data available

STOT - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Product:

Remarks : No data available

Repeated dose toxicity

Product:

Remarks : No data available

Components:

Fatty acids, C14-18 and C16-18-unsatd., maleated:

Species : Rat, male and female
NOAEL : 1.000 mg/kg
Application Route : Oral
Method : OECD Test Guideline 422
GLP : yes
Target Organs : Stomach

Aspiration toxicity

Not classified due to lack of data.

Product:

No data available

11.2 Information on other hazards

Endocrine disrupting properties

Not classified due to lack of data.

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Further information

Product:

Remarks : Solvents may degrease the skin.

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish : Remarks: No data available

Components:

Fatty acids, C14-18 and C16-18-unsatd., maleated:

Toxicity to fish : LL50 (Leuciscus idus (Golden orfe)): > 150 mg/l
Exposure time: 48 h
Test Type: static test
Method: DIN 38412
GLP: no

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Test Type: semi-static test
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants : ErL50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Test Type: static test

Method: OECD Test Guideline 201
GLP: yes

Toxicity to microorganisms : EC50 (activated sludge): > 1.000 mg/l
Exposure time: 3 h
Test Type: static test
Method: OECD Test Guideline 209
GLP: yes

Xylene, mixture of isomers:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1 mg/l
Exposure time: 24 h
Test Type: Immobilization
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 2,2 mg/l
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201
GLP: yes

NOEC (Pseudokirchneriella subcapitata (green algae)): 0,44 mg/l
Exposure time: 72 h
Test Type: Growth inhibition
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC: > 1,3 mg/l
Exposure time: 56 d
Species: Oncorhynchus mykiss (rainbow trout)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 1,17 mg/l
Exposure time: 7 d
Species: Daphnia sp. (water flea)

NOEC: 0,96 mg/l
Exposure time: 7 d
Species: Daphnia sp. (water flea)

2,6-dimethylheptan-4-one:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 30 mg/l
Exposure time: 96 h
Test Type: flow-through test
Method: OECD Test Guideline 203
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 37,2 mg/l
Exposure time: 48 h
Test Type: semi-static test
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants	:	(Pseudokirchneriella subcapitata (green algae)): 46,9 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 GLP: yes

maleic anhydride:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 75 mg/l Exposure time: 96 h Test Type: static test GLP: no
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 42,81 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 GLP: yes
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata): 74,35 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 GLP: yes
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 10 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) GLP: no

12.2 Persistence and degradability

Product:

Biodegradability	:	Remarks: No data available

Components:

Fatty acids, C14-18 and C16-18-unsatd., maleated:

Biodegradability	:	Result: Not readily biodegradable. Method: OECD Test Guideline 301 GLP: yes

Xylene, mixture of isomers:

Biodegradability	:	Test Type: aerobic Result: Readily biodegradable. Method: OECD Test Guideline 301F GLP: yes

2,6-dimethylheptan-4-one:

Biodegradability	:	Result: Readily biodegradable. Method: OECD Test Guideline 301D GLP: no

maleic anhydride:

Biodegradability	:	Result: Readily biodegradable. Method: OECD Test Guideline 301B GLP: yes

12.3 Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: No data available

Components:

Xylene, mixture of isomers:

Bioaccumulation	:	Species: Oncorhynchus mykiss (rainbow trout) Exposure time: 56 d Bioconcentration factor (BCF): 25,9 GLP: no
Partition coefficient: n-octanol/water	:	Pow: 3,2 (20 °C) pH: 7

maleic anhydride:

Partition coefficient: n-octanol/water	:	log Pow: -2,61 (19,8 °C) pH: 4 - 9 Method: OECD Test Guideline 107 GLP: yes

12.4 Mobility in soil

Components:

maleic anhydride:

Distribution among environmental compartments	:	Koc: 42, log Koc: 1,63

12.5 Results of PBT and vPvB assessment

Product:

Assessment	:	This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Components:

octamethylcyclotetrasiloxane [D4]:

Assessment	:	Persistent, Bioaccumulative and Toxic (PBT).
	:	Very persistent and very bioaccumulative (vPvB).

12.6 Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

14.1 UN number or ID number

ADN : UN 1993

ADR : UN 1993

RID : UN 1993

IMDG : UN 1993

IATA : UN 1993

14.2 UN proper shipping name

ADN : FLAMMABLE LIQUID, N.O.S.
(Xylene, Diisobutyl ketone)

ADR : FLAMMABLE LIQUID, N.O.S.
(Xylene, Diisobutyl ketone)

RID	:	FLAMMABLE LIQUID, N.O.S. (Xylene, Diisobutyl ketone)
IMDG	:	FLAMMABLE LIQUID, N.O.S. (XYLENE, Diisobutyl ketone)
IATA	:	Flammable liquid, n.o.s. (Xylene, Diisobutyl ketone)

14.3 Transport hazard class(es)

ADN	:	3
ADR	:	3
RID	:	3
IMDG	:	3
IATA	:	3

14.4 Packing group

ADN

Packing group	:	III
Classification Code	:	F1
Hazard Identification Number	:	30
Labels	:	3

ADR

Packing group	:	III
Classification Code	:	F1
Hazard Identification Number	:	30
Labels	:	3
Tunnel restriction code	:	D/E

RID

Packing group	:	III
Classification Code	:	F1
Hazard Identification Number	:	30
Labels	:	3

IMDG

Packing group	:	III
Labels	:	3
EmS Code	:	F-E, S-E
Remarks	:	IMDG Code segregation group - none

IATA (Cargo)

Packing instruction (cargo aircraft)	:	366
Packing group	:	III
Labels	:	Flammable Liquids

IATA (Passenger)

Packing instruction (passenger aircraft)	:	355
Packing instruction (LQ)	:	Y344

Packing group	:	III
Labels	:	Flammable Liquids

14.5 Environmental hazards

ADN
Environmentally hazardous : no

ADR
Environmentally hazardous : no

RID
Environmentally hazardous : no

IMDG
Marine pollutant : no

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

Relevant EU provisions transposed through retained EU law

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries must be considered:: Number on list 3 Number on list 5: benzene Number on list 72: benzene Number on list 75: If you intend to use this product as tattoo ink, please contact your vendor.
REACH - List of substances subject to authorisation (Annex XIV)	:	Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	P5c	FLAMMABLE LIQUIDS

15.2 Chemical safety assessment

For further information see eSDS.

SECTION 16: Other information

Items where relevant changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Full text of H-Statements

EUH440	:	Accumulates in the environment and living organisms including in humans.
EUH441	:	Strongly accumulates in the environment and living organisms including in humans.
H225	:	Highly flammable liquid and vapour.
H226	:	Flammable liquid and vapour.
H302	:	Harmful if swallowed.
H304	:	May be fatal if swallowed and enters airways.
H312	:	Harmful in contact with skin.
H314	:	Causes severe skin burns and eye damage.
H315	:	Causes skin irritation.
H317	:	May cause an allergic skin reaction.
H318	:	Causes serious eye damage.
H319	:	Causes serious eye irritation.
H332	:	Harmful if inhaled.
H334	:	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	:	May cause respiratory irritation.
H361f	:	Suspected of damaging fertility.
H372	:	Causes damage to organs through prolonged or repeated exposure if inhaled.
H373	:	May cause damage to organs through prolonged or repeated exposure.
H410	:	Very toxic to aquatic life with long lasting effects.
H412	:	Harmful to aquatic life with long lasting effects.
EUH071	:	Corrosive to the respiratory tract.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Aquatic Chronic	:	Long-term (chronic) aquatic hazard
Asp. Tox.	:	Aspiration hazard
Eye Dam.	:	Serious eye damage
Eye Irrit.	:	Eye irritation
Flam. Liq.	:	Flammable liquids
PBT	:	Persistent, bioaccumulative and toxic
Repr.	:	Reproductive toxicity
Resp. Sens.	:	Respiratory sensitisation
Skin Corr.	:	Skin corrosion
Skin Irrit.	:	Skin irritation
Skin Sens.	:	Skin sensitisation
STOT RE	:	Specific target organ toxicity - repeated exposure
STOT SE	:	Specific target organ toxicity - single exposure

vPvB	:	Very persistent and very bioaccumulative
2000/39/EC	:	Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
GB EH40	:	UK. EH40 WEL - Workplace Exposure Limits
GB EH40 BAT	:	UK. Biological monitoring guidance values
2000/39/EC / TWA	:	Limit Value - eight hours
2000/39/EC / STEL	:	Short term exposure limit
GB EH40 / TWA	:	Long-term exposure limit (8-hour TWA reference period)
GB EH40 / STEL	:	Short-term exposure limit (15-minute reference period)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; BGW - Biological Limit Values; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); LSPN - List of Hazardous Notified Substances (Chile); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Classification of the mixture:		**Classification procedure:**
Flam. Liq. 3	H226	Based on product data or assessment
Skin Sens. 1	H317	Calculation method
STOT SE 3	H335	Calculation method
STOT RE 2	H373	Calculation method

Aquatic Chronic 3	H412	Calculation method

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

GB / EN

Annex: Exposure Scenarios

Table of Contents

Number	Title
ES 1	Formulation & (re)packing of substances and mixtures; Industrial uses (SU3).; Formulation [mixing] of preparations and/or re-packaging (SU10).
ES 2	Use in coatings; Industrial uses (SU3).
ES 3	Use in laboratories; Industrial uses (SU3).; Formulation [mixing] of preparations and/or re-packaging (SU10).
ES 4	Use in coatings; Professional uses (SU22).
ES 5	Use in laboratories; Professional uses (SU22).
ES 6	Use in coatings; Consumer uses (SU21).

ES 1: Formulation & (re)packing of substances and mixtures; Industrial uses (SU3).; Formulation [mixing] of preparations and/or re-packaging (SU10).

1.1. Title section

Exposure Scenario name	:	Formulation & (re)packing of substances and mixtures
Structured Short Title	:	Formulation & (re)packing of substances and mixtures; Industrial uses (SU3).; Formulation [mixing] of preparations and/or re-packaging (SU10).
Substance	:	xylenes CAS-No.: 1330-20-7

Environment		
CS 1	**Formulation into mixture**	ERC2
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Use in closed batch process (synthesis or formulation)**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Mixing or blending in batch processes**	PROC5
CS 7	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 8	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 9	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 10	**Chemical production where opportunity for exposure arises**	PROC4
CS 11	**Use as laboratory reagent**	PROC15

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Formulation into mixture (ERC2)

Product (article) characteristics

Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	150000000 kg
Fraction of regional tonnage used locally	:	15000000 kg
Emission days	:	300
Technical and organisational conditions and measures		
Prevent discharge of undissolved substance to or recover from onsite wastewater.		
Conditions and measures related to sewage treatment plant		
STP type	:	Onsite sewage treatment plant
STP sludge treatment	:	No application of sewage sludge to soil
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Waste treatment	:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

1.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C

Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle substance within a closed system.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

1.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		

Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

1.2.4. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

1.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics
Covers concentrations up to 100 %

Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Ensure material transfers are under containment or extract ventilation. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

1.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		

Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

1.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Transfer via enclosed lines. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

1.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics

Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented Clear spills immediately. Return IBCs or tanks to supplier for re-use.		

1.2.9. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented Transfer via enclosed lines. Put lids on containers immediately after use. Clear spills immediately.		

1.2.10. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

1.2.11. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle in a fume cupboard or under extract ventilation.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Formulation into mixture (ERC2)

Release route	Release rate	Release estimation method
Air	0,2 kg/day	
Waste	3 kg/day	
Soil	1 kg/day	

Protection Target	Exposure estimate	RCR
Freshwater	0,0796 mg/L	0,244
Freshwater sediment	0,854 mg/kg wet weight	0,854

Marine water	0,00796 mg/L	0,024
Marine sediment	0,0853 mg/kg wet weight	0,085
Sewage treatment plant	0,791 mg/L	0,120

1.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,01 ppm	0
dermal	systemic	long-term	0,34 mg/kg bw/day	0
combined routes				0

1.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	10 ppm	0,56
dermal	systemic	long-term	1,37 mg/kg bw/day	0,01
combined routes				0,57

1.3.4. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	17,5 ppm	0,99
dermal	systemic	long-term	0,34 mg/kg bw/day	0
combined routes				0,99

1.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	14 ppm	0,79
dermal	systemic	long-term	6,86 mg/kg bw/day	0,04
combined routes				0,83

1.3.6. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	13,71 mg/kg bw/day	0,08
combined routes				0,92

1.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	13,71 mg/kg bw/day	0,04
combined routes				0,92

1.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	1,50 ppm	0,08
dermal	systemic	long-term	6,86 mg/kg bw/day	0,04
combined routes				0,12

1.3.9. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	6,86 mg/kg bw/day	0,04
combined routes				0,88

1.3.10. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure	Exposure	RCR

		indicator	estimate	
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	3,43 mg/kg bw/day	0,02
combined routes				0,87

1.3.11. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	10 ppm	0,56
dermal	systemic	long-term	0,34 mg/kg bw/day	0
combined routes				0,57

1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Further details on scaling and control technologies are provided in SPERC factsheet.

ES 2: Use in coatings; Industrial uses (SU3).

2.1. Title section

Exposure Scenario name	:	Use in coatings
Structured Short Title	:	Use in coatings; Industrial uses (SU3).
Substance	:	xylenes CAS-No.: 1330-20-7

Environment		
CS 1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Use in closed batch process (synthesis or formulation)**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Mixing or blending in batch processes**	PROC5
CS 7	**Industrial spraying**	PROC7
CS 8	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 9	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 10	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 11	**Roller application or brushing**	PROC10
CS 12	**Treatment of articles by dipping and pouring**	PROC13
CS 13	**Chemical production where opportunity for exposure arises**	PROC4
CS 14	**Use as laboratory reagent**	PROC15

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	50000000 kg
Fraction of regional tonnage used locally	:	5000000 kg
Emission days	:	300
Conditions and measures related to sewage treatment plant		
STP type	:	Onsite sewage treatment plant
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Waste treatment	:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

2.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa

Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle substance within a closed system.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

2.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		

Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

2.2.4. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

2.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics

Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Ensure material transfers are under containment or extract ventilation. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

2.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		

Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

2.2.7. Control of worker exposure: Industrial spraying (PROC7)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Carry out in a vented booth provided with laminar airflow.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

2.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics

Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Drain down system prior to equipment break-in or maintenance. Provide a good standard of controlled ventilation (5 to 10 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

2.2.9. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling.		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented Clear spills immediately. Return IBCs or tanks to supplier for re-use.		

2.2.10. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented Transfer via enclosed lines. Put lids on containers immediately after use.		

Clear spills immediately.

2.2.11. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide extract ventilation to points where emissions occur.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

2.2.12. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours

Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented Clear up spills immediately and dispose of waste safely. Avoid manual contact with wet work pieces.		

2.2.13. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		

Assumes a good basic standard of occupational hygiene is implemented

2.2.14. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle in a fume cupboard or under extract ventilation.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Protection Target	Exposure estimate	RCR
Freshwater	0,0375 mg/L	0,115
Marine water	0,00375 mg/L	0,012
Freshwater sediment	0,402 mg/kg wet weight	0,148
Marine sediment	0,0402 mg/kg wet weight	0,015

Sewage treatment plant	0,369 mg/L	0,056

2.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,01 ppm	0
dermal	systemic	long-term	0,34 mg/kg bw/day	0
combined routes				0

2.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	10 ppm	0,56
dermal	systemic	long-term	1,37 mg/kg bw/day	0,01
combined routes				0,57

2.3.4. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	17,5 ppm	0,99
dermal	systemic	long-term	0,34 mg/kg bw/day	0
combined routes				0,99

2.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	14 ppm	0,79
dermal	systemic	long-term	6,86 mg/kg bw/day	0,04
combined routes				0,83

2.3.6. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure route	Health effect	Exposure	Exposure	RCR

		indicator	estimate	
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	0,07 mg/kg bw/day	0,08
combined routes				0,85

2.3.7. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	12,50 ppm	0,71
dermal	systemic	long-term	2,14 mg/kg bw/day	0,01
combined routes				0,72

2.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	5 ppm	0,28
dermal	systemic	long-term	1,37 mg/kg bw/day	0,01
combined routes				0,29

2.3.9. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	1,50 ppm	0,08
dermal	systemic	long-term	6,86 mg/kg bw/day	0,04
combined routes				0,12

2.3.10. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	6,86 mg/kg bw/day	0,04
combined routes				0,88

2.3.11. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	5 ppm	0,28
dermal	systemic	long-term	27,43 mg/kg bw/day	0,15
combined routes				0,43

2.3.12. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	13,71 mg/kg bw/day	0,08
combined routes				0,92

2.3.13. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	3,43 mg/kg bw/day	0,02
combined routes				0,87

2.3.14. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,60 ppm	0,03
dermal	systemic	long-term	0,03 mg/kg bw/day	0
combined routes				0,03

2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Further details on scaling and control technologies are provided in SPERC factsheet.

ES 3: Use in laboratories; Industrial uses (SU3).; Formulation [mixing] of preparations and/or re-packaging (SU10).

3.1. Title section

Exposure Scenario name	:	Use in laboratories
Structured Short Title	:	Use in laboratories; Industrial uses (SU3).; Formulation [mixing] of preparations and/or re-packaging (SU10).
Substance	:	xylenes CAS-No.: 1330-20-7

Environment		
CS 1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article), Formulation of preparations**	ERC4, ERC2
Worker		
CS 2	**Roller application or brushing**	PROC10
CS 3	**Use as laboratory reagent**	PROC15

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4) / Formulation of preparations (ERC2)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	1000000 kg
Fraction of regional tonnage used locally	:	100000 kg
Emission days	:	300
Technical and organisational conditions and measures		
Prevent discharge of undissolved substance to or recover from onsite wastewater.		

Conditions and measures related to sewage treatment plant		
STP type	:	Onsite sewage treatment plant
STP sludge treatment	:	No application of sewage sludge to soil
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	External treatment and disposal of waste should comply with applicable local and/or national regulations. External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

3.2.2. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Use long handled tools.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
Assumes a good basic standard of occupational hygiene is implemented

3.2.3. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	10 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
No specific measures identified.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4) / Formulation of preparations (ERC2)

Protection Target	**Exposure estimate**	**RCR**
Freshwater	0,00217 mg/L	0,066
Marine water	0,000217 mg/L	0,007

Freshwater sediment	0,0233 mg/kg wet weight	0,086
Marine sediment	0,0232 mg/kg wet weight	0,009
Soil	0,266 mg/kg wet weight	0,131
Sewage treatment plant	0,211 mg/L	0,032

3.3.2. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	1,37 mg/kg bw/day	0,01
combined routes				0,86

3.3.3. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	10 ppm	0,56
dermal	systemic	long-term	0,03 mg/kg bw/day	0
combined routes				0,56

3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Further details on scaling and control technologies are provided in SPERC factsheet.

ES 4: Use in coatings; Professional uses (SU22).

4.1. Title section

Exposure Scenario name	:	Use in coatings
Structured Short Title	:	Use in coatings; Professional uses (SU22).
Substance	:	xylenes CAS-No.: 1330-20-7

Environment		
CS 1	**Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems**	ERC8a, ERC8d
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions**	PROC2
CS 4	**Use in closed batch process (synthesis or formulation)**	PROC3
CS 5	**Chemical production where opportunity for exposure arises**	PROC4
CS 6	**Mixing or blending in batch processes**	PROC5
CS 7	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 8	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 9	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9
CS 10	**Roller application or brushing**	PROC10
CS 11	**Non-industrial spraying**	PROC11
CS 12	**Treatment of articles by dipping and pouring**	PROC13
CS 13	**Chemical production where opportunity for exposure arises**	PROC4
CS 14	**Use as laboratory reagent**	PROC15
CS 15	**Manual activities involving hand contact**	PROC19

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Wide dispersive indoor use of processing aids in open systems (ERC8a) / Wide dispersive outdoor use of processing aids in open systems (ERC8d)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	50000000 kg
Fraction of regional tonnage used locally	:	5000000 kg
Emission days	:	300
Technical and organisational conditions and measures		
Prevent discharge of undissolved substance to or recover from onsite wastewater.		
Conditions and measures related to sewage treatment plant		
STP type	:	Onsite sewage treatment plant
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	External treatment and disposal of waste should comply with applicable local and/or national regulations. External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

4.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Product (article) characteristics

Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle substance within a closed system.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

4.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

4.2.4. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle substance within a closed system. Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Use drum pumps.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented Clear up spills immediately and dispose of waste safely.		

4.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Ensure operation is undertaken outdoors. Avoid carrying out activities involving exposure for more than 1 hour per day.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

4.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours

Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Avoid carrying out activities involving exposure for more than 1 hour per day.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

4.2.7. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Transfer via enclosed lines. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		

Assumes a good basic standard of occupational hygiene is implemented

4.2.8. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Transfer via enclosed lines. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented Clear spills immediately. Return IBCs or tanks to supplier for re-use.		

4.2.9. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa

Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented Transfer via enclosed lines. Put lids on containers immediately after use. Clear spills immediately.		

4.2.10. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Wear a respirator conforming to EN140.		

Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

4.2.11. Control of worker exposure: Non-industrial spraying (PROC11)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Carry out in a vented booth provided with laminar airflow.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

4.2.12. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid

Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide extract ventilation to points where emissions occur. Avoid carrying out activities involving exposure for more than 1 hour per day.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented Clear up spills immediately and dispose of waste safely. Avoid manual contact with wet work pieces.		

4.2.13. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		

Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

4.2.14. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Handle in a fume cupboard or under extract ventilation.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

4.2.15. Control of worker exposure: Manual activities involving hand contact (PROC19)

Product (article) characteristics
Covers concentrations up to 5 %

Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: Wide dispersive indoor use of processing aids in open systems (ERC8a) / Wide dispersive outdoor use of processing aids in open systems (ERC8d)

Protection Target	Exposure estimate	RCR
Freshwater	0,00150 mg/L	0,005
Marine water	0,000145 mg/L	< 0,001
Freshwater sediment	0,0160 mg/kg wet weight	0,006
Marine sediment	0,0156 mg/kg wet weight	< 0,001
Soil	0,0117 mg/kg wet weight	0,006
Sewage treatment plant	0,00866 mg/L	0,001

4.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,01 ppm	0
dermal	systemic	long-term	0,34 mg/kg bw/day	0
combined routes				0

4.3.3. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	4 ppm	0,23
dermal	systemic	long-term	0,14 mg/kg bw/day	0
combined routes				0,23

4.3.4. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	7,5 ppm	0,42
dermal	systemic	long-term	0,03 mg/kg bw/day	0
combined routes				0,42

4.3.5. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	7 ppm	0,39
dermal	systemic	long-term	1,37 mg/kg bw/day	0,01
combined routes				0,40

4.3.6. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	6 ppm	0,34
dermal	systemic	long-term	13,71 mg/kg bw/day	0,08
combined routes				0,41

4.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	14 ppm	0,79
dermal	systemic	long-term	13,71 mg/kg bw/day	0,08
combined routes				0,87

4.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	6,86 mg/kg bw/day	0,04
combined routes				0,88

4.3.9. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	6,86 mg/kg bw/day	0,04
combined routes				0,88

4.3.10. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	3 ppm	0,17
dermal	systemic	long-term	27,43 mg/kg bw/day	0,15
combined routes				0,32

4.3.11. Worker exposure: Non-industrial spraying (PROC11)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	5 ppm	0,28
dermal	systemic	long-term	13,71 mg/kg bw/day	0,08
combined routes				0,29

4.3.12. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	12 ppm	0,68
dermal	systemic	long-term	0,69 mg/kg bw/day	0
combined routes				0,68

4.3.13. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	15 ppm	0,85
dermal	systemic	long-term	3,43 mg/kg bw/day	0,02
combined routes				0,87

4.3.14. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	10 ppm	0,56
dermal	systemic	long-term	0,34 mg/kg bw/day	0
combined routes				0,57

4.3.15. Worker exposure: Manual activities involving hand contact (PROC19)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	6 ppm	0,34
dermal	systemic	long-term	28,29 mg/kg bw/day	0,16
combined routes				0,50

4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Further details on scaling and control technologies are provided in SPERC factsheet.

ES 5: Use in laboratories; Professional uses (SU22).

5.1. Title section

Exposure Scenario name	:	Use in laboratories
Structured Short Title	:	Use in laboratories; Professional uses (SU22).
Substance	:	xylenes CAS-No.: 1330-20-7

Environment		
CS 1	**Industrial use of processing aids in processes and products, not becoming part of articles**	ERC4
Worker		
CS 2	**Roller application or brushing**	PROC10
CS 3	**Use as laboratory reagent**	PROC15

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Industrial use of processing aids in processes and products, not becoming part of articles (ERC4)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	50000000 kg
Fraction of regional tonnage used locally	:	5000000 kg
Emission days	:	300
Conditions and measures related to sewage treatment plant		
STP type	:	Onsite sewage treatment plant
STP sludge treatment	:	No application of sewage sludge to soil
STP type	:	Municipal Sewage Treatment Plant

STP effluent	:	2.000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	External treatment and disposal of waste should comply with applicable local and/or national regulations. External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

5.2.2. Control of worker exposure: Roller application or brushing (PROC10)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Use long handled tools. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Handle in a fume cupboard or under extract ventilation.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

5.2.3. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	10 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
No specific measures identified. Handle in a fume cupboard or under extract ventilation.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374.		
Other conditions affecting workers exposure		
Temperature	:	Assumes use at not more than 20°C above ambient temperature.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Assumes a good basic standard of occupational hygiene is implemented		

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure: Industrial use of processing aids in processes and products, not becoming part of articles (ERC4)

Protection Target	Exposure estimate	RCR
Freshwater	0,00150 mg/L	0,005
Marine water	0,000145 mg/L	< 0,000
Freshwater sediment	0,0160 mg/kg wet weight	0,006
Marine sediment	0,00156 mg/kg wet weight	0,001
Soil	0,0112 mg/kg wet weight	0,006

Sewage treatment plant	0,00866 mg/L	0,001

5.3.2. Worker exposure: Roller application or brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	14 ppm	0,78
dermal	systemic	long-term	27,43 mg/kg bw/day	0,15
combined routes				0,93

5.3.3. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	10 ppm	0,56
dermal	systemic	long-term	0,34 mg/kg bw/day	0
combined routes				0,56

5.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Further details on scaling and control technologies are provided in SPERC factsheet.

ES 6: Use in coatings; Consumer uses (SU21).

6.1. Title section

Exposure Scenario name	:	Use in coatings
Structured Short Title	:	Use in coatings; Consumer uses (SU21).
Substance	:	xylenes CAS-No.: 1330-20-7

Environment		
CS 1	**Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems**	ERC8a, ERC8d
Consumer		
CS 2	Adhesives, sealants	PC1
CS 3	Coatings and paints, thinners, paint removers	PC9a
CS 4	Fillers, putties, plasters, modelling clay	PC9b
CS 5	Finger paints	PC9c
CS 6	Non-metal surface treatment products	PC15
CS 7	Ink and toners	PC18
CS 8	Leather treatment products	PC23
CS 9	Lubricants, greases, release products	PC24
CS 10	Polishes and wax blends	PC31
CS 11	Textile dyes, finishing and impregnating products; including bleaches and other processing aids	PC34

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Wide dispersive indoor use of processing aids in open systems (ERC8a) / Wide dispersive outdoor use of processing aids in open systems (ERC8d)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	50000000 kg
Fraction of regional tonnage used locally	:	5000000 kg
Emission days	:	365
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	External treatment and disposal of waste should comply with applicable local and/or national regulations. External recovery and recycling of waste should comply with applicable local and/or national regulations.
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

6.2.2. Control of consumer exposure: Adhesives, sealants (PC1)

Product (article) characteristics		
Covers concentrations up to 30 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount per use	:	0,009 kg
Use frequency	:	365 days/year
Other conditions affecting consumers exposure		
Room size	:	20 m3

6.2.3. Control of consumer exposure: Coatings and paints, thinners, paint removers (PC9a)

Product (article) characteristics		
Covers concentrations up to 0,5 %		
Physical form of product	:	Liquid

Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	2,760 kg
Use frequency	:	4 days/year
Other conditions affecting consumers exposure		
Room size	:	20 m3

6.2.4. Control of consumer exposure: Fillers, putties, plasters, modelling clay (PC9b)

Product (article) characteristics		
Covers concentrations up to 2 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	0,085 kg
Use frequency	:	12 days/year
Other conditions affecting consumers exposure		
Room size	:	20 m3

6.2.5. Control of consumer exposure: Finger paints (PC9c)

Product (article) characteristics		
Covers concentrations up to 1 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	0,001 kg

Use frequency	:	365 days/year
Other conditions affecting consumers exposure		
Room size	:	20 m3

6.2.6. Control of consumer exposure: Non-metal surface treatment products (PC15)

Product (article) characteristics		
Covers concentrations up to 0,5 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	2,760 kg
Use frequency	:	4 days/year
Other conditions affecting consumers exposure		
Room size	:	20 m3

6.2.7. Control of consumer exposure: Ink and toners (PC18)

Product (article) characteristics		
Covers concentrations up to 10 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	0,004 kg
Use frequency	:	365 days/year

6.2.8. Control of consumer exposure: Leather treatment products (PC23)

Product (article) characteristics

Covers concentrations up to 25 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	0,056 kg
Use frequency	:	29 days/year

6.2.9. Control of consumer exposure: Lubricants, greases, release products (PC24)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	2,200 kg
Use frequency	:	4 days/year
Other conditions affecting consumers exposure		
Room size	:	34 m3

6.2.10. Control of consumer exposure: Polishes and wax blends (PC31)

Product (article) characteristics		
Covers concentrations up to 10 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	0,142 kg
Use frequency	:	29 days/year

Other conditions affecting consumers exposure		
Room size	:	20 m3

6.2.11. Control of consumer exposure: Textile dyes, finishing and impregnating products; including bleaches and other processing aids (PC34)

Product (article) characteristics		
Covers concentrations up to 10 %		
Physical form of product	:	Liquid
Vapour pressure	:	0,5 kPa
Temperature	:	20 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	0,115 kg
Use frequency	:	365 days/year
Other conditions affecting consumers exposure		
Room size	:	20 m3

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure: Wide dispersive indoor use of processing aids in open systems (ERC8a) / Wide dispersive outdoor use of processing aids in open systems (ERC8d)

Protection Target	**Exposure estimate**	**RCR**
Freshwater	0,00150 mg/L	0,005
Marine water	0,000145 mg/L	< 0,000
Freshwater sediment	0,0160 mg/kg wet weight	0,006
Marine sediment	0,00156 mg/kg wet weight	0,001
Soil		0,006
Sewage treatment plant		0,001

6.3.2. Consumer exposure: Adhesives, sealants (PC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	1,55 mg/kg dry weight	
oral	systemic	long-term	0 mg/kg dry weight	
combined routes				0,59
inhalative	systemic	long-term	5,525 mg/m³	

6.3.3. Consumer exposure: Coatings and paints, thinners, paint removers (PC9a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0 mg/kg dry weight	
oral	systemic	long-term	0 mg/kg dry weight	
combined routes				0,01
inhalative	systemic	long-term	0,126 mg/m³	

6.3.4. Consumer exposure: Fillers, putties, plasters, modelling clay (PC9b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0 mg/kg dry weight	
oral	systemic	long-term	0 mg/kg dry weight	
combined routes				0,01
inhalative	systemic	long-term	0,176 mg/m³	

6.3.5. Consumer exposure: Finger paints (PC9c)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	2,21 mg/kg dry weight	
oral	systemic	long-term	1,35 mg/kg dry weight	
combined routes				0,86
inhalative	systemic	long-term	0 mg/m³	

6.3.6. Consumer exposure: Non-metal surface treatment products (PC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0 mg/kg dry weight	
oral	systemic	long-term	0 mg/kg dry weight	
combined routes				0,01
inhalative	systemic	long-term	0,126 mg/m³	

6.3.7. Consumer exposure: Ink and toners (PC18)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	1,04 mg/kg dry weight	
oral	systemic	long-term	0 mg/kg dry weight	
combined routes				0,70
inhalative	systemic	long-term	10,179 mg/m³	

6.3.8. Consumer exposure: Leather treatment products (PC23)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	3,26 mg/kg dry weight	
oral	systemic	long-term	0 mg/kg dry weight	
combined routes				0,07
inhalative	systemic	long-term	0,607 mg/m³	

6.3.9. Consumer exposure: Lubricants, greases, release products (PC24)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,74 mg/kg dry weight	
oral	systemic	long-term	0 mg/kg dry weight	
combined routes				0,01
inhalative	systemic	long-term	0,044 mg/m³	

6.3.10. Consumer exposure: Polishes and wax blends (PC31)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,50 mg/kg dry weight	
oral	systemic	long-term	0 mg/kg dry weight	
combined routes				0,07
inhalative	systemic	long-term	0,903 mg/m³	

6.3.11. Consumer exposure: Textile dyes, finishing and impregnating products; including bleaches and other processing aids (PC34)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,12 mg/kg dry weight	
oral	systemic	long-term	0 mg/kg dry weight	
combined routes				0,60
inhalative	systemic	long-term	8,797 mg/m³	

6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Further details on scaling and control technologies are provided in SPERC factsheet.