Material Safety Data Sheet

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SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

METHYLENE CHLORIDE

Version 5.0 Print Date 2014/02/18

Revision date / valid from 2014/02/18 **MSDS code: MMEC100**

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

1.1. Product identifier

Trade name	:	METHYLENE CHLORIDE
Substance name	:	dichloromethane
Index-No.	:	602-004-00-3
CAS-No.	:	75-09-2
EC-No.	:	200-838-9
Registration number	:	01-2119480404-41-xxxx

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

Use of the Substance/Mixture	:	Identified use: See table in front of appendix for a complete overview of identified uses.
Uses advised against	:	At this moment we have not identified any uses advised against

1.3. Details of the supplier of the safety data sheet

Company	:	Brenntag UK & Ireland Albion House, Rawdon Park GB LS19 7XX Leeds Yeadon
Telephone	:	+44 (0) 113 3879 200
Telefax	:	+44 (0) 113 3879 280
E-mail address	:	msds@brenntag.co.uk

1.4. Emergency telephone number

Emergency telephone number	:	Emergency only telephone number (open 24 hours): +44 (0) 1865 407333 (N.C.E.C. Culham)

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008			
Hazard class	**Hazard category**	**Target Organs**	**Hazard statements**
Carcinogenicity	Category 2	---	H351
Skin irritation	Category 2	---	H315

Specific target organ toxicity - single exposure	Category 3	---	H335
Specific target organ toxicity - repeated exposure	Category 2	---	H373
Specific target organ toxicity - single exposure	Category 3	---	H336
Serious eye damage/eye irritation	Category 2	---	H319

For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Directive 67/548/EEC or 1999/45/EC	
Hazard symbol / Category of danger	**Risk phrases**
Carcinogenic Category 3 (Carc.Cat.3)	R40
Irritant (Xi)	R36/37/38
	R67
Harmful (Xn)	R48/22

For the full text of the R-phrases mentioned in this Section, see Section 16.

Most important adverse effects

Human Health : See section 11 for toxicological information.

Physical and chemical hazards : See section 9 for physicochemical information.

Potential environmental effects : See section 12 for environmental information.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard symbols :

Signal word : Warning

Hazard statements :

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure if

swallowed.

Precautionary statements

Prevention	:	P201	Obtain special instructions before use.
		P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
		P262	Do not get in eyes, on skin, or on clothing.
		P271	Use only outdoors or in a well-ventilated area.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response	:	P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Hazardous components which must be listed on the label:

- dichloromethane

2.3. Other hazards

For Results of PBT and vPvB assessment see section 12.5.

Section 3: Composition/information on ingredients

3.1. Substances

Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008) Hazard class / Hazard category	Hazard statements	Classification (67/548/EEC)
dichloromethane				
Index-No. : 602-004-00-3 CAS-No. : 75-09-2 EC-No. : 200-838-9 Registration : 01-2119480404-41-xxxx C&L-No. : 02-2119752537-31-0000	<= 100	Carc.2 Skin Irrit.2 STOT SE3 STOT RE2 Eye Irrit.2	H351 H315 H335, H336 H373 H319	Carc.Cat.3; R40 Irritant; Xi; R36/37/38 R67 Harmful; Xn; R48/22

For the full text of the R-phrases mentioned in this Section, see Section 16.
For the full text of the H-Statements mentioned in this Section, see Section 16.

Section 4: First aid measures

4.1. Description of first aid measures

General advice	: Remove from exposure, lie down. Remove to fresh air. Keep patient warm and at rest. If breathing is irregular or stopped, administer artificial respiration. Take off all contaminated clothing immediately. Symptoms of poisoning may not appear for several hours. Keep under medical supervision for at least 48 hours. Consult a physician.
If inhaled	: Remove to fresh air. Give oxygen. Consult a physician.
In case of skin contact	: Wash off immediately with soap and plenty of water. If skin irritation persists, call a physician.
In case of eye contact	: Rinse thoroughly with plenty of water, also under the eyelids. Consult a physician.
If swallowed	: Clean mouth with water and drink afterwards plenty of water. If swallowed, do not induce vomiting - seek medical advice.

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

Symptoms	: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. See Section 11 for more detailed information on health effects and symptoms.
Effects	: See Section 11 for more detailed information on health effects and symptoms.

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

Treatment	: Treat symptomatically.Symptoms may be delayed.The exposed person may need to be kept under medical surveillance for 48 hours.

Section 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. The product itself does not burn.
Unsuitable extinguishing media	: High volume water jet

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting	: In case of fire hazardous decomposition products may be produced such as: Carbon monoxide, Hydrogen chloride gas, Phosgene, Chlorine

5.3. Advice for firefighters

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.Wear appropriate body protection (full protective suit)
Further information	:	Cool closed containers exposed to fire with water spray.Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Keep people away from and upwind of spill/leak. Provide adequate ventilation. Keep away from heat and sources of ignition. Avoid contact with skin and eyes. Do not breathe gas/fumes/vapour/spray.

6.2. Environmental precautions

Environmental precautions	:	Do not flush into surface water or sanitary sewer system. If the product contaminates rivers and lakes or drains inform respective authorities. Avoid subsoil penetration. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning up	:	Ensure adequate ventilation. This material and its container must be disposed of as hazardous waste. 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).
Further information	:	Treat recovered material as described in the section "Disposal considerations".

6.4. Reference to other sections

See Section 1 for emergency contact information.
See Section 8 for information on personal protective equipment.
See Section 13 for waste treatment information.

Section 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling	:	Handle in accordance with good industrial hygiene and safety practice. Avoid contact with the skin and the eyes. Keep container tightly closed. Provide sufficient air exchange and/or exhaust in work rooms. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.
Hygiene measures	:	Take off all contaminated clothing immediately. Do not breathe

gas/fumes/vapour/spray. Avoid contact with the skin and the eyes. Keep away from food, drink and animal feedingstuffs. Smoking, eating and drinking should be prohibited in the application area. 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	:	Suitable materials for containers: Mild steel; glass; Unsuitable materials for containers: Light metals; Aluminium; Use appropriate container to avoid environmental contamination. Keep in a dry, cool and well-ventilated place. Keep in an area equipped with solvent resistant flooring. Keep away from direct sunlight.
Advice on protection against fire and explosion	:	Keep away from sources of ignition - No smoking. Keep away from heat. Do not spray on a naked flame or any incandescent material.
Fire-fighting class	:	flame-retardant (only with supporting fire)
Advice on common storage	:	Keep away from combustible material.
German storage class	:	6.1B Non combustible substances, toxic

7.3. Specific end use(s)

Specific use(s)	:	Identified use: See table in front of appendix for a complete overview of identified uses.

Section 8: Exposure controls/personal protection

8.1. Control parameters

Component: dichloromethane	**CAS-No. 75-09-2**
Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)	

DNEL
Workers, Acute - systemic effects, Inhalation : 353 mg/m3

DNEL
Workers, Long-term - systemic effects, Skin contact : 2395 mg/kg bw/day

DNEL
Workers, Local effects, Skin contact : 88.3 mg/cm2
Long-term exposition

DNEL

Workers, Local effects, Ingestion Long-term exposition	:	0.06 mg/kg bw/day
DNEL Consumer use, Acute - systemic effects, Inhalation	:	706 mg/m3
DNEL Consumer use, Long-term - systemic effects, Skin contact	:	4750 mg/kg bw/day
DNEL Consumer use, Long-term - systemic effects, Inhalation	:	353 mg/m3

Predicted No Effect Concentration (PNEC)

Fresh water	:	0.54 mg/l
Marine water	:	0.194 mg/l
Periodical releases	:	0.27 mg/l
Fresh water sediment	:	4.47 mg/kg dwt
Marine sediment	:	1.61 mg/kg dwt
Soil	:	0.583 mg/kg
Sewage treatment plant (STP)	:	26 mg/l

Other Occupational Exposure Limit Values

EH40 WEL, Short Term Exposure Limit (STEL):
300 ppm, 1,060 mg/m3

EH40 WEL, Time Weighted Average (TWA):
100 ppm, 350 mg/m3

EH40 WEL, Skin designation:
Can be absorbed through the skin.

ELV (IE), Short Term Exposure Limit (STEL):
150 ppm, 550 mg/m3

ELV (IE), Time Weighted Average (TWA):
50 ppm, 174 mg/m3

ELV (IE), Skin designation:
Can be absorbed through the skin.

8.2. Exposure controls

Appropriate engineering controls
Refer to protective measures listed in sections 7 and 8.

Personal protective equipment

Respiratory protection

Advice	:	Respirator with filter for organic vapour Recommended Filter type:AX

Hand protection

Advice	:	Wear suitable gloves. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Protective gloves should be replaced at first signs of wear.
Material	:	fluorocarbon rubber
Break through time	:	8 h
Glove thickness	:	0.4 mm
Material	:	(PE=polyethylene; EVAL=ethylene-vinyl alcohol-copolymer)
Break through time	:	8 h
Glove thickness	:	0.4 mm

Eye protection

Advice	:	Tightly fitting safety goggles

Skin and body protection

Advice	:	Wear suitable protective clothing.

Environmental exposure controls

General advice	:	Do not flush into surface water or sanitary sewer system. If the product contaminates rivers and lakes or drains inform respective authorities. Avoid subsoil penetration. Local authorities should be advised if significant spillages cannot be contained.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	:	liquid
Colour	:	colourless
Odour	:	sweet
Odour Threshold	:	250 ppm

pH	:	not applicable
Solidification point	:	-95.1 °C
Boiling point/boiling range	:	40 °C
Flash point	:	not applicable
Evaporation rate	:	no data available
Flammability (solid, gas)	:	not applicable
Upper explosion limit	:	22 %(V)
Lower explosion limit	:	13 %(V)
Vapour pressure	:	475 hPa (20 °C)
Relative vapour density	:	2.93
Density	:	1.33 g/cm3 (20 °C)
Water solubility	:	13.7 g/l (20 °C)
Partition coefficient: n-octanol/water	:	log Kow 1.25
Auto-ignition temperature	:	605 °C
Thermal decomposition	:	no data available
Viscosity, dynamic	:	0.41 mPa.s (22 °C)
Viscosity, kinematic	:	0.31 mm2/s (25 °C)
Explosive properties	:	EU legislation: Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.

9.2. Other information

No further information available.

Section 10: Stability and reactivity

10.1. Reactivity

Advice : No decomposition if stored and applied as directed.

10.2. Chemical stability

Advice : Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions : No information available.

10.4. Conditions to avoid

Conditions to avoid : No information available.

10.5. Incompatible materials

Materials to avoid : Aluminium, Zinc, Oxidizing agents, Strong acids and strong bases

10.6. Hazardous decomposition products

Hazardous decomposition products : Hydrogen chloride gas, Carbon monoxide, Phosgene

Section 11: Toxicological information

11.1. Information on toxicological effects

Component:	**dichloromethane**	**CAS-No. 75-09-2**
Acute toxicity		
Oral		
LD50	: > 2000 mg/kg (rat)	
Inhalation		
LC50	: 86 mg/l (mouse; 4 h) Vapours may cause irritation, headache, dizziness and may have narcotic effects and other central nervous effects.	
Dermal		
LD50	: > 2000 mg/kg (rat) (OECD Test Guideline 402)	
Irritation		
Skin		
Result	: Irritating to skin. Prolonged skin contact may defat the skin and produce dermatitis. May cause irritation of the mucous membranes. Penetrates through the skin and may cause same symptom as at inhalation.	
Eyes		

Result	:	Irritating to eyes.

Sensitisation

Result	:	Patch test on human volunteers did not demonstrate sensitisation properties.

CMR effects

CMR Properties

Carcinogenicity	:	Suspected of causing cancer.
Mutagenicity	:	Results of tests with experimental animals from genetic toxicity studies were negative and positive. It is not considered mutagenic.
Teratogenicity	:	Did not show teratogenic effects in animal experiments.
Reproductive toxicity	:	Animal testing did not show any effects on fertility.

Specific Target Organ Toxicity

Single exposure

Inhalation	:	Target Organs: Respiratory system May cause respiratory irritation.
Inhalation	:	Target Organs: Central nervous system May cause drowsiness or dizziness.

Repeated exposure

Ingestion	:	May cause damage to organs through prolonged or repeated exposure.

Other toxic properties

Aspiration hazard

no data available

Further information

Other relevant toxicity information	:	Inhalation of high vapour concentrations can cause CNS-depression and narcosis. Risk of serious damage to the lungs (by inhalation). Liver injury may occur. Ingestion causes damage of central nervous system, liver, kidneys, blood and bone marrow. Limited evidence of a carcinogenic effect.

Experience with human exposure	:	Repeated and prolonged exposure to solvents may cause brain and nervous system damage.

Section 12: Ecological information

12.1. Toxicity

Component:	dichloromethane	CAS-No. 75-09-2
Acute toxicity		
Fish		
LC50	:	193 mg/l (Pimephales promelas; 96 h)
LC50	:	220 mg/l (Lepomis macrochirus; 96 h) (Directive 67/548/EEC, Annex V, C.1.)
Toxicity to daphnia and other aquatic invertebrates		
EC50	:	480 mg/l (Daphnia magna; 48 h) (Immobilization)
LC50	:	27 mg/l (Daphnia magna; 48 h)
algae		
EbC50	:	> 662 mg/l (Pseudokirchneriella subcapitata; 96 h)
NOEC	:	550 mg/l (Scenedesmus subspicatus; 8 d)
Bacteria		
EC50	:	2590 mg/l (activated sludge; 40 min) (OECD Test Guideline 209)
Chronic toxicity		
Fish		
NOEC	:	83 mg/l (Pimephales promelas (fathead minnow); 28 d)
Aquatic invertebrates		
LC50	:	109 mg/l (Daphnia magna (Water flea); 48 h)

12.2. Persistence and degradability

Component:	dichloromethane	CAS-No. 75-09-2

Persistence and degradability

Biodegradability

Result : 5 - 26 % (Exposure Time: 28 d)(OECD 301 C)
Not readily biodegradable.

12.3. Bioaccumulative potential

Component:	dichloromethane	CAS-No. 75-09-2

Bioaccumulation

Result : log Kow 1.25

BCF: 2 - 40 (Fish)
Does not bioaccumulate.

12.4. Mobility in soil

Component:	dichloromethane	CAS-No. 75-09-2

Mobility

Soil : Highly mobile in soils

12.5. Results of PBT and vPvB assessment

Component:	dichloromethane	CAS-No. 75-09-2

Results of PBT and vPvB assessment

Result : This substance is not considered to be persistent, bioaccumulating nor toxic (PBT)., This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6. Other adverse effects

Component:	dichloromethane	CAS-No. 75-09-2

Additional ecological information

Result	:	The product evapourates readily. Do not flush into surface water or sanitary sewer system.

Section 13: Disposal considerations

13.1. Waste treatment methods

Product	:	Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains.
Contaminated packaging	:	Empty remaining contents. Empty containers should be taken to an approved waste handling site for recycling or disposal. Dispose of as unused product.
European Waste Catalogue Number	:	No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

Section 14: Transport information

14.1. UN number

1593

14.2. UN proper shipping name

ADR : DICHLOROMETHANE
RID : DICHLOROMETHANE
IMDG : DICHLOROMETHANE

14.3. Transport hazard class(es)

ADR-Class	:	6.1
(Labels; Classification Code; Hazard identification No; Tunnel restriction code)		6.1; T1; 60; (E)
RID-Class	:	6.1
(Labels; Classification Code; Hazard identification No)		6.1; T1; 60
IMDG-Class	:	6.1
(Labels; EmS)		6.1; F-A, S-A

14.4. Packaging group

ADR : III
RID : III
IMDG : III

14.5. Environmental hazards

Labeling according to 5.2.1.8 ADR	: no
Labeling according to 5.2.1.8 RID	: no
Labeling according to 5.2.1.6.3 IMDG	: no
Classification as environmentally hazardous according to 2.9.3 IMDG	: no
Classified as “P” according to 2.10 IMDG	: no

14.6. Special precautions for user

Note : not applicable

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

IMDG : Not applicable.

Section 15: Regulatory information

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

UK ISR : dichloromethane: Annual reporting level threshold: 1,000 kg

UK ISR : dichloromethane: Annual reporting level threshold: 10; kg

dichloromethane

EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)
Listed Point Nos.: 59

EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)
EC Number: 200-838-9

:

Notification status

dichloromethane:

Regulatory List	Notification	Notification number
AICS	YES	
DSL	YES	
INV (CN)	YES	
DCS (JP)	YES	(2)-36
ENCS (JP)	YES	(2)-36
ISHL (JP)	YES	(2)-36
NZ CLSC	YES	
TSCA	YES	
EINECS	YES	200-838-9
KECI (KR)	YES	KE-23893
PICCS (PH)	YES	
IECSC	YES	

15.2. Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

Section 16: Other information

Full text of R-phrases referred to under sections 2 and 3.

R36/37/38	Irritating to eyes, respiratory system and skin.
R40	Limited evidence of a carcinogenic effect.
R48/22	Harmful: danger of serious damage to health by prolonged exposure if swallowed.
R67	Vapours may cause drowsiness and dizziness.

Full text of H-Statements referred to under sections 2 and 3.

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure if swallowed.

Further information

Other information : The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship. The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text

|| Indicates updated section.

No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 9, 15	1	NA	ES8529
2	Use as an intermediate	3	8, 9	19	1, 2, 3, 4, 8a, 8b, 15	6a	NA	ES1944
3	Formulation & (re)packing of substances and mixtures	3	10	NA	3, 4, 5, 8a, 8b, 9, 15	2	NA	ES1946
4	Formulation & (re)packing of substances and mixtures	22	NA	NA	8a, 8b, 9	8a, 8d	NA	ES1989
5	Uses in coatings	3	11, 18	NA	7, 10	4	NA	ES1957
6	Uses in coatings	22	NA	NA	10, 11	8a, 8d	NA	ES1968
7	Use in Cleaning Agents	3	5, 7, 12, 13, 17	35	2, 3, 4, 7, 10, 13	4, 7	NA	ES1960
8	Use in Cleaning Agents	22	NA	35	10, 11, 13	8a, 8d	NA	ES1971
9	Use as Functional Fluids	3	NA	16	1, 2, 3, 4	7	NA	ES1966
10	Use in laboratories	22	24	21	10, 15	8a	NA	ES2013
11	Use as blowing agents	3	NA	NA	1, 2, 3, 4, 8b, 9, 12	4	NA	ES1964
12	Use as extraction agent and/or processing aid	3	5, 9	NA	1, 2, 3, 4, 10, 15	4	NA	ES1953

1. Short title of Exposure Scenario 1: Manufacture of substance	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Environmental Release Categories	ERC1: Manufacture of substances

2.1 Contributing scenario controlling environmental exposure for: ERC1		
Amount used	Maximum daily site tonnage (kg/day):	8570 kg
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Domestic sewage treatment is not assumed.	

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Indoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems) Continuous process	Handle substance within a closed system.(PROC1, PROC2)

	with sample collection	
	General exposures (closed systems) Use in contained batch processes	Handle substance within a predominantly closed system provided with extract ventilation. Provide extract ventilation to points where emissions occur.(PROC3)
	Batch process	Provide extract ventilation to points where emissions occur.(PROC4)
	Material transfers Bulk transfers Non-dedicated facility	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a)
	Material transfers Bulk transfers Dedicated facility	Fill containers/cans at dedicated filling points supplied with local extract ventilation. Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Material transfers Drum/batch transfers Small package filling Pouring from small containers	Fill containers/cans at dedicated filling points supplied with local extract ventilation. Ensure material transfers are under containment or extract ventilation.(PROC9)
	Laboratory activities with sample collection	Handle in a fume cupboard or under extract ventilation.(PROC15)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC1	---	Fresh water	PEC	5.17µg/L	0.00957
ERC1	---	Marine water	PEC	0.416µg/L	0.00214
ERC1	---	Fresh water sediment	PEC	9.3µg/kg wwt	0.00957
ERC1	---	Marine sediment	PEC	0.749µg/kg wwt	0.00214
ERC1	---	Soil	PEC	0.126µg/kg	0.000245
ERC1	---	Groundwater	PEC	0.0498µg/L	0.000092
ERC1	---	Sewage treatment plant (STP)	PEC	0.883µg/L	0.000034

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0.01ppm	0.0001
PROC1	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001

PROC2	---	Worker - inhalative, long-term	50ppm	0.5
PROC2	---	Worker - dermal, long-term - systemic	0.27mg/kg/day	0.00006
PROC3	---	Worker - inhalative, long-term	10ppm	0.1
PROC3	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001
PROC4	---	Worker - inhalative, long-term	10ppm	0.1
PROC4	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC8a	---	Worker - inhalative, long-term	50ppm	0.5
PROC8a	---	Worker - dermal, long-term - systemic	2.74mg/kg/day	0.0006
PROC8b	---	Worker - inhalative, long-term	4.5ppm	0.05
PROC8b	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC9	---	Worker - inhalative, long-term	20ppm	0.2
PROC9	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC15	---	Worker - inhalative, long-term	50ppm	0.5
PROC15	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 2: Use as an intermediate		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals	
Chemical product category	PC19: Intermediate	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)	
2.1 Contributing scenario controlling environmental exposure for: ERC6a		
Amount used	Regional use tonnage (tons/year):	2570 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Maximum daily site tonnage (kg/day):	8567 kg
	Annual site tonnage (tons/year):	2570 ton(s)/year
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	5.00 .10-4
	Emission or Release Factor: Water	0.01
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage	2,000 m3/d

	treatment plant effluent	
	Degradation efficiency	93.5 %

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Indoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems) Continuous process with sample collection	Handle substance within a closed system.(PROC1, PROC2)
	General exposures (closed systems) Use in contained batch processes	Handle substance within a predominantly closed system provided with extract ventilation.(PROC3)
	Batch process	Provide extract ventilation to points where emissions occur.(PROC4)
	Material transfers Bulk transfers Non-dedicated facility	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a)
	Material transfers Bulk transfers Dedicated facility	Fill containers/cans at dedicated filling points supplied with local extract ventilation.(PROC8b)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6a	---	Fresh water	PEC	0.283mg/L	0.524
ERC6a	---	Marine water	PEC	0.0282mg/L	0.145
ERC6a	---	Fresh water sediment	PEC	0.509mg/kg	0.524
ERC6a	---	Marine sediment	PEC	0.0507mg/kg	0.145
ERC6a	---	Soil	PEC	0.308mg/kg	0.599
ERC6a	---	Sewage treatment plant (STP)	PEC	2.78mg/L	0.107

The default values from the Reach Guidance R.16 are replaced by the values from the ESVOC2 SpERC

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0.01ppm	0.0001
PROC1	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001
PROC2	---	Worker - inhalative, long-term - systemic	50ppm	0.50
PROC2	---	Worker - dermal, long-term - systemic	0.27mg/kg/day	0.00006
PROC3	---	Worker - inhalative, long-term - systemic	10ppm	0.10
PROC3	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001
PROC4	---	Worker - inhalative, long-term - systemic	10ppm	0.10
PROC4	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC8a	---	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC8a	---	Worker - dermal, long-term - systemic	2.74mg/kg/day	0.0006
PROC8b	---	Worker - inhalative, long-term - systemic	4.50ppm	0.05
PROC8b	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC15	---	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC15	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 3: Formulation & (re)packing of substances and mixtures	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Environmental Release Categories	ERC2: Formulation of preparations

2.1 Contributing scenario controlling environmental exposure for: ERC2		
Paint strippers		
Amount used	Regional use tonnage (tons/year):	2810 ton(s)/year
	Fraction of Regional tonnage used locally:	0.085
	Maximum daily site tonnage (kg/day):	797 kg
	Annual site tonnage (tons/year):	239 ton(s)/year
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.025
	Emission or Release Factor: Water	0.02
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	

Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %

2.2 Contributing scenario controlling environmental exposure for: ERC2

Relevant for aerosol

Amount used	Regional use tonnage (tons/year):	1120 ton(s)/year
	Fraction of Regional tonnage used locally:	0.893
	Maximum daily site tonnage (kg/day):	3334 kg
	Annual site tonnage (tons/year):	1000 ton(s)/year
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.025
	Emission or Release Factor: Water	0.02
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %

2.3 Contributing scenario controlling environmental exposure for: ERC2

Metal degreasers

Amount used	Regional use tonnage (tons/year):	1180 ton(s)/year

	Fraction of Regional tonnage used locally:	1
	Maximum daily site tonnage (kg/day):	3933 kg
	Annual site tonnage (tons/year):	1180 ton(s)/year
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.025
	Emission or Release Factor: Water	0.02
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %

2.4 Contributing scenario controlling environmental exposure for: ERC2

Relevant for Adhesives

Amount used	Regional use tonnage (tons/year):	2070 ton(s)/year
	Fraction of Regional tonnage used locally:	0.275
	Maximum daily site tonnage (kg/day):	1898 kg
	Annual site tonnage (tons/year):	569 ton(s)/year
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.01
	Emission or Release Factor: Water	0
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %

2.5 Contributing scenario controlling worker exposure for: PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Indoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems) Use in contained batch processes	Handle substance within a predominantly closed system provided with extract ventilation.(PROC3)
	Batch process	Provide extract ventilation to points where emissions occur.(PROC4)
	Mixing operations (open systems)	Provide extract ventilation to points where emissions occur.(PROC5)
	Material transfers Bulk transfers Manual Non-dedicated facility	Provide extract ventilation to points where emissions occur.(PROC8a)
	Material transfers Bulk transfers Dedicated facility	Fill containers/cans at dedicated filling points supplied with local extract ventilation.(PROC8b)
	Drum and small package filling Dedicated facility	Fill containers/cans at dedicated filling points supplied with local extract ventilation.(PROC9)
Organisational measures to prevent /limit releases, dispersion	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	

and exposure	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	See section 2.1	Fresh water	PEC	0.057mg/L	0.105
ERC2	See section 2.1	Marine water	PEC	0.0056mg/L	0.029
ERC2	See section 2.1	Fresh water sediment	PEC	0.102mg/kg	0.105
ERC2	See section 2.1	Marine sediment	PEC	0.010mg/kg	0.029
ERC2	See section 2.1	Soil	PEC	0.058mg/kg	0.11
ERC2	See section 2.1	Sewage treatment plant (STP)	PEC	0.517mg/L	0.020
ERC2	See section 2.2	Fresh water	PEC	0.0050mg/L	0.00919
ERC2	See section 2.2	Marine water	PEC	0.004mg/L	0.00206
ERC2	See section 2.2	Fresh water sediment	PEC	0.0089mg/kg	0.00919
ERC2	See section 2.2	Marine sediment	PEC	0.0007mg/kg	0.00206
ERC2	See section 2.2	Soil	PEC	0.0013mg/kg	0.00251
ERC2	See section 2.2	Sewage treatment plant (STP)	PEC	0.0011mg/L	0.00004
ERC2	See section 2.3	Fresh water	PEC	0.259mg/L	0.480
ERC2	See section 2.3	Marine water	PEC	0.029mg/L	0.133
ERC2	See section 2.3	Fresh water sediment	PEC	0.467mg/kg	0.480
ERC2	See section 2.3	Marine sediment	PEC	0.047mg/kg	0.133
ERC2	See section 2.3	Soil	PEC	0.283mg/kg	0.550
ERC2	See section 2.3	Sewage treatment plant (STP)	PEC	2.54mg/L	0.098
ERC2	See section 2.4	Fresh water	PEC	0.0049mg/L	0.00899
ERC2	See section 2.4	Marine water	PEC	0.0004mg/L	0.00201
ERC2	See section 2.4	Fresh water sediment	PEC	0.0087mg/kg	0.00899
ERC2	See section 2.4	Marine sediment	PEC	0.0007mg/kg	0.00201
ERC2	See section 2.4	Soil	PEC	0.0004mg/kg	0.00733
ERC2	See section 2.4	Sewage treatment plant (STP)	PEC	0mg/L	0

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC3	---	Worker - inhalative, long-term - systemic	10ppm	0.10

PROC3	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001
PROC4	---	Worker - inhalative, long-term - systemic	10ppm	0.10
PROC4	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC5	---	Worker - inhalative, long-term - systemic	25ppm	0.25
PROC5	---	Worker - dermal, long-term - systemic	2.74mg/kg/day	0.0006
PROC8a	---	Worker - inhalative, long-term - systemic	25ppm	0.3
PROC8a	---	Worker - dermal, long-term - systemic	2.74mg/kg/day	0.0006
PROC8b	---	Worker - inhalative, long-term - systemic	4.5ppm	0.05
PROC8b	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC9	---	Worker - inhalative, long-term - systemic	20ppm	0.2
PROC9	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC15	---	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC15	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 4: Formulation & (re)packing of substances and mixtures		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Amount used	Regional use tonnage (tons/year):	2810 ton(s)/year
	Fraction of Regional tonnage used locally:	0.002
	Maximum daily site tonnage (kg/day):	5.14 kg
	Annual site tonnage (tons/year):	5.62 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	1
	Emission or Release Factor: Water	1
	Emission or Release Factor: Soil	0.01
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	No soil emission controls required, Required removal efficiency is 0%
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %
2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC9		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	4 hours/day(Indoor PROC8a)
	Frequency of use	1 hours/day(Outdoor PROC8a, PROC8b, PROC9)
Technical conditions and measures to control dispersion from source towards the worker	Transfer from/pouring from containers Non-dedicated facility	Provide extract ventilation to points where emissions occur.(PROC8a)
	Transfer from/pouring from containers Drum and small package filling Dedicated facility	Fill containers/cans at dedicated filling points supplied with local extract ventilation. Use dedicated equipment.(PROC8b, PROC9)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	---	Fresh water	PEC	0.0064mg/L	0.012
ERC8a, ERC8d	---	Marine water	PEC	0.0006mg/L	0.00291
ERC8a, ERC8d	---	Fresh water sediment	PEC	0.012mg/kg	0.012
ERC8a, ERC8d	---	Marine sediment	PEC	0.0010mg/kg	0.00291
ERC8a, ERC8d	---	Soil	PEC	0.0029mg/kg	0.00553
ERC8a, ERC8d	---	Sewage treatment plant (STP)	PEC	0.016mg/L	0.000618

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC8a	Indoor use.	Worker - inhalative, long-term - systemic	60ppm	0.6
PROC8a	Indoor use.	Worker - dermal, long-term - systemic	2.74mg/kg/day	0.0006
PROC8a	Outdoor use.	Worker - inhalative, long-term - systemic	70ppm	0.7
PROC8a	Outdoor use.	Worker - dermal, long-term - systemic	2.74mg/kg/day	0.0006
PROC8b	Indoor use.	Worker - inhalative, long-term - systemic	25ppm	0.3
PROC8b	Indoor use.	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003

PROC8b	Outdoor use.	Worker - inhalative, long-term - systemic	35ppm	0.4
PROC8b	Outdoor use.	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC9	Indoor use.	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC9	Indoor use.	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC9	Outdoor use.	Worker - inhalative, long-term - systemic	35ppm	0.4
PROC9	Outdoor use.	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 5: Uses in coatings		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU11: Manufacture of rubber products SU18: Manufacture of furniture	
Process categories	PROC7: Industrial spraying PROC10: Roller application or brushing	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Relevant for aerosol		
Amount used	Regional use tonnage (tons/year):	1120 ton(s)/year
	Fraction of Regional tonnage used locally:	0.893
	Maximum daily site tonnage (kg/day):	10720 kg
	Annual site tonnage (tons/year):	1072 ton(s)/year
Frequency and duration of use	Continuous exposure	100 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.95
	Emission or Release Factor: Water	1
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %
2.2 Contributing scenario controlling environmental exposure for: ERC4		

Relevant for Adhesives

Amount used	Regional use tonnage (tons/year):	2070 ton(s)/year
	Fraction of Regional tonnage used locally:	0.08
	Maximum daily site tonnage (kg/day):	6900 kg
	Annual site tonnage (tons/year):	2070 ton(s)/year
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	6.27 .10-3
	Emission or Release Factor: Water	0
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %

2.3 Contributing scenario controlling worker exposure for: PROC7, PROC10

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Indoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Spraying	Carry out in a vented booth provided with laminar airflow.(PROC7)
	Rolling, Brushing	Provide extract ventilation to points where

		emissions occur.(PROC10)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	See section 2.1	Fresh water	PEC	0.0049mg/L	0.00919
ERC4	See section 2.1	Marine water	PEC	0.0004mg/L	0.00206
ERC4	See section 2.1	Fresh water sediment	PEC	0.0089mg/kg	0.00919
ERC4	See section 2.1	Marine sediment	PEC	0.0007mg/kg	0.00206
ERC4	See section 2.1	Soil	PEC	0.045mg/kg	0.087
ERC4	See section 2.1	Sewage treatment plant (STP)	PEC	0.0011mg/L	0.00004
ERC4	See section 2.2	Fresh water	PEC	0.0049mg/L	0.00898
ERC4	See section 2.2	Marine water	PEC	0.0004mg/L	0.00201
ERC4	See section 2.2	Fresh water sediment	PEC	0.0087mg/kg	0.00898
ERC4	See section 2.2	Marine sediment	PEC	0.0007mg/kg	0.00201
ERC4	See section 2.2	Soil	PEC	0.0021mg/kg	0.00398
ERC4	See section 2.2	Sewage treatment plant (STP)	PEC	0mg/L	0

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC7	---	Worker - inhalative, long-term - systemic	25ppm	0.25
PROC7	---	Worker - dermal, long-term - systemic	8.57mg/kg/day	0.002
PROC10	---	Worker - inhalative, long-term - systemic	25ppm	0.25
PROC10	---	Worker - dermal, long-term - systemic	5.49mg/kg/day	0.001

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that

risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 6: Uses in coatings		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC10: Roller application or brushing PROC11: Non industrial spraying	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Relevant for aerosol		
Amount used	Regional use tonnage (tons/year):	1120 ton(s)/year
	Fraction of Regional tonnage used locally:	0.002
	Maximum daily site tonnage (kg/day):	6.14 kg
	Annual site tonnage (tons/year):	2.24 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	1
	Emission or Release Factor: Water	1
	Emission or Release Factor: Soil	0.01
	Indoor. Outdoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	No soil emission controls required, Required removal efficiency is 0%
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %
2.2 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Relevant for Adhesives		
Amount used	Regional use tonnage	2070 ton(s)/year

	(tons/year):	
	Fraction of Regional tonnage used locally:	0.002
	Maximum daily site tonnage (kg/day):	11.3 kg
	Annual site tonnage (tons/year):	4.14 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	1
	Emission or Release Factor: Water	1
	Emission or Release Factor: Soil	0.01
	Indoor. Outdoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	No soil emission controls required, Required removal efficiency is 0%
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %
2.3 Contributing scenario controlling worker exposure for: PROC10, PROC11		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	1 hours/day(PROC10)
	Frequency of use	4 hours/day(PROC11)
Other operational conditions affecting workers exposure	Indoor/Outdoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Rolling, Brushing	Provide extract ventilation to points where emissions occur.(PROC10)
	Spraying	Provide extract ventilation to points where emissions occur.(PROC11)
Organisational measures to prevent /limit releases, dispersion	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	

and exposure		
Conditions and measures related to personal protection, hygiene and health evaluation	Spraying	Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	See section 2.1	Fresh water	PEC	0.012mg/L	0.022
ERC8a, ERC8d	See section 2.1	Marine water	PEC	0.0012mg/L	0.00593
ERC8a, ERC8d	See section 2.1	Fresh water sediment	PEC	0.022mg/kg	0.022
ERC8a, ERC8d	See section 2.1	Marine sediment	PEC	0.0020mg/kg	0.00593
ERC8a, ERC8d	See section 2.1	Soil	PEC	0.0084mg/kg	0.016
ERC8a, ERC8d	See section 2.1	Sewage treatment plant (STP)	PEC	0.076mg/L	0.00293
ERC8a, ERC8d	See section 2.2	Fresh water	PEC	0.019mg/L	0.035
ERC8a, ERC8d	See section 2.2	Marine water	PEC	0.0019mg/L	0.00954
ERC8a, ERC8d	See section 2.2	Fresh water sediment	PEC	0.035mg/kg	0.035
ERC8a, ERC8d	See section 2.2	Marine sediment	PEC	0.0033mg/kg	0.00954
ERC8a, ERC8d	See section 2.2	Soil	PEC	0.016mg/kg	0.00563
ERC8a, ERC8d	See section 2.2	Sewage treatment plant (STP)	PEC	0.146mg/L	0.00564

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC10	Indoor use.	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC10	Indoor use.	Worker - dermal, long-term - systemic	2.74mg/kg/day	0.001
PROC10	Outdoor use.	Worker - inhalative, long-term - systemic	35ppm	0.4
PROC10	Outdoor use.	Worker - dermal, long-term - systemic	2.74mg/kg/day	0.001
PROC11	Indoor use.	Worker - inhalative, long-term - systemic	60ppm	0.6
PROC11	Indoor use.	Worker - dermal, long-term - systemic	10.71mg/kg/day	0.002
PROC11	Outdoor use.	Worker - inhalative, long-term - systemic	35ppm	0.4
PROC11	Outdoor use.	Worker - dermal, long-term - systemic	10.71mg/kg/day	0.002

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

Exposure Scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 7: Use in Cleaning Agents		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU5: Manufacture of textiles, leather, fur SU7: Printing and reproduction of recorded media SU12: Manufacture of plastics products, including compounding and conversion SU13: Manufacture of other non-metallic mineral products, e.g. plasters, cement SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment	
Chemical product category	PC35: Washing and cleaning products (including solvent based products)	
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC7: Industrial spraying PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC7: Industrial use of substances in closed systems	
2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC7		
Metal degreasers		
Amount used	Regional use tonnage (tons/year):	1180 ton(s)/year
	Fraction of Regional tonnage used locally:	0.046
	Maximum daily site tonnage (kg/day):	59000 kg
	Annual site tonnage (tons/year):	1180 ton(s)/year
Frequency and duration of use	Continuous exposure	20 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.3
	Emission or Release Factor: Water	1 .10-4
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	

Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %
2.2 Contributing scenario controlling environmental exposure for: ERC4, ERC7		
Paint strippers		
Amount used	Regional use tonnage (tons/year):	2810 ton(s)/year
	Fraction of Regional tonnage used locally:	0.11
	Maximum daily site tonnage (kg/day):	140500 kg
	Annual site tonnage (tons/year):	2810 ton(s)/year
Frequency and duration of use	Continuous exposure	20 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.3
	Emission or Release Factor: Water	1 .10-4
	Emission or Release Factor: Soil	0
	Indoor. Outdoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	No soil emission controls required, Required removal efficiency is 0%
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %
2.3 Contributing scenario controlling environmental exposure for: ERC4, ERC7		
Relevant for Cleaning agent, Relevant for Functional Fluids		
Amount used	Regional use tonnage (tons/year):	257 ton(s)/year

	Fraction of Regional tonnage used locally:	0.04
	Maximum daily site tonnage (kg/day):	500 kg
	Annual site tonnage (tons/year):	10 ton(s)/year
Frequency and duration of use	Continuous exposure	100 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.01
	Emission or Release Factor: Water	1 .10-3
	Emission or Release Factor: Soil	1 .10-3
	Indoor. Outdoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	No soil emission controls required, Required removal efficiency is 0%
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %

2.4 Contributing scenario controlling worker exposure for: PROC2, PROC3, PROC4, PROC7, PROC10, PROC13

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Application of cleaning products in closed systems Vapour degreasing bath	Handle substance within a closed system.(PROC2)
	Application of cleaning products in closed systems Use in contained systems Drum/batch transfers	Handle substance within a predominantly closed system provided with extract ventilation.(PROC3)

	Batch process	Provide extract ventilation to points where emissions occur.(PROC4)
	Manual Surfaces cleaning No spraying	Provide extract ventilation to points where emissions occur.(PROC10)
	Manual Surfaces cleaning Dipping, immersion and pouring	Provide extract ventilation to points where emissions occur. or Avoid carrying out operation for more than 1 hour.(PROC13)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	Spraying	Wear a respirator conforming to EN140 with Type A filter or better.(PROC7)
	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4, ERC7	See section 2.1	Fresh water	PEC	0.0064mg/L	0.012
ERC4, ERC7	See section 2.1	Marine water	PEC	0.0005mg/L	0.0028
ERC4, ERC7	See section 2.1	Fresh water sediment	PEC	0.012mg/kg	0.012
ERC4, ERC7	See section 2.1	Marine sediment	PEC	0.0010mg/kg	0.0028
ERC4, ERC7	See section 2.1	Soil	PEC	0.0028mg/kg	0.00546
ERC4, ERC7	See section 2.1	Sewage treatment plant (STP)	PEC	0.016mg/L	0.000618
ERC4, ERC7	See section 2.2	Fresh water	PEC	0.0064mg/L	0.012
ERC4, ERC7	See section 2.2	Marine water	PEC	0.0006mg/L	0.00291
ERC4, ERC7	See section 2.2	Fresh water sediment	PEC	0.012mg/kg	0.012
ERC4, ERC7	See section 2.2	Marine sediment	PEC	0.0010mg/kg	0.00291
ERC4, ERC7	See section 2.2	Soil	PEC	0.0029mg/kg	0.00553
ERC4, ERC7	See section 2.2	Sewage treatment plant (STP)	PEC	0.016mg/L	0.00062
ERC4, ERC7	See section 2.3	Fresh water	PEC	0.0065mg/L	0.012
ERC4, ERC7	See section 2.3	Marine water	PEC	0.0006mg/L	0.00287
ERC4, ERC7	See section 2.3	Fresh water sediment	PEC	0.0121mg/kg	0.012
ERC4, ERC7	See section 2.3	Marine sediment	PEC	0.0010mg/kg	0.00287
ERC4, ERC7	See section 2.3	Soil	PEC	0.0019mg/kg	0.00361
ERC4, ERC7	See section 2.3	Sewage treatment plant (STP)	PEC	0.017mg/L	0.00066

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	---	Worker - inhalative, long-term - systemic	50ppm	0.50
PROC2	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.00006
PROC3	---	Worker - inhalative, long-term - systemic	10ppm	0.10
PROC3	---	Worker - dermal, long-term - systemic	0.34mg/kg/day	0.00001
PROC4	---	Worker - inhalative, long-term - systemic	10ppm	0.10
PROC4	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC7	---	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC7	---	Worker - dermal, long-term - systemic	42.86mg/kg/day	0.002
PROC10	---	Worker - inhalative, long-term - systemic	25ppm	0.3
PROC10	---	Worker - dermal, long-term - systemic	27.43mg/kg/day	0.001
PROC13	---	Worker - inhalative, long-term - systemic	25ppm	0.3
PROC13	---	Worker - dermal, long-term - systemic	13.71mg/kg/day	0.0006

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 8: Use in Cleaning Agents		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Chemical product category	PC35: Washing and cleaning products (including solvent based products)	
Process categories	PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Metal degreasers		
Amount used	Regional use tonnage (tons/year):	1180 ton(s)/year
	Fraction of Regional tonnage used locally:	0.002
	Maximum daily site tonnage (kg/day):	6.47 kg
	Annual site tonnage (tons/year):	2.36 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	1
	Emission or Release Factor: Water	1
	Emission or Release Factor: Soil	0.01
	Indoor. Outdoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	No soil emission controls required, Required removal efficiency is 0%
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %
2.2 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		

Paint strippers		
Amount used	Regional use tonnage (tons/year):	2810 ton(s)/year
	Fraction of Regional tonnage used locally:	0.002
	Maximum daily site tonnage (kg/day):	15.4 kg
	Annual site tonnage (tons/year):	5.62 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	1
	Emission or Release Factor: Water	1
	Emission or Release Factor: Soil	0.01
	Indoor. Outdoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	No soil emission controls required, Required removal efficiency is 0%
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %

2.3 Contributing scenario controlling worker exposure for: PROC10

Relevant for Cleaning agent		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Indoor/Outdoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Organisational measures to	Provide basic employee training to prevent /minimise exposures and to report	

prevent /limit releases, dispersion and exposure	any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	Equipment cleaning and maintenance Manual Rolling, Brushing	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

2.4 Contributing scenario controlling worker exposure for: PROC10, PROC11

Paint strippersgraffiti remover

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Indoor/Outdoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	cleaning Large surfaces Rolling, Brushing Cleaning with high pressure washers Spraying	Wear a full face respirator conforming to EN140 with Type A filter or better.(PROC10, PROC11)
	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

2.5 Contributing scenario controlling worker exposure for: PROC13

Paint strippers

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	cleaning Manual Dipping, immersion and pouring	Provide extract ventilation to points where emissions occur.(PROC13)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	cleaning Manual Dipping, immersion and	Wear a respirator conforming to EN140 with Type A filter or better.(PROC13)

	pouring	
	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

2.6 Contributing scenario controlling worker exposure for: PROC11

Degreasing products		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Indoor/Outdoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	cleaning Cleaning with high pressure washers Spraying	Wear a full face respirator conforming to EN140 with Type A filter or better.(PROC11)
	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	See section 2.1	Fresh water	PEC	0.0064mg/L	0.012
ERC8a, ERC8d	See section 2.1	Marine water	PEC	0.0005mg/L	0.0028
ERC8a, ERC8d	See section 2.1	Fresh water sediment	PEC	0.012mg/kg	0.012
ERC8a, ERC8d	See section 2.1	Marine sediment	PEC	0.0010mg/kg	0.0028
ERC8a, ERC8d	See section 2.1	Soil	PEC	0.0028mg/kg	0.00546
ERC8a, ERC8d	See section 2.1	Sewage treatment plant (STP)	PEC	0.016mg/L	0.000618
ERC8a, ERC8d	See section 2.2	Fresh water	PEC	0.0064mg/L	0.012
ERC8a, ERC8d	See section 2.2	Marine water	PEC	0.0006mg/L	0.00291
ERC8a, ERC8d	See section 2.2	Fresh water sediment	PEC	0.012mg/kg	0.012
ERC8a, ERC8d	See section 2.2	Marine sediment	PEC	0.0010mg/kg	0.00291
ERC8a, ERC8d	See section 2.2	Soil	PEC	0.0029mg/kg	0.00553
ERC8a, ERC8d	See section 2.2	Sewage treatment plant (STP)	PEC	0.016mg/L	0.000618

Workers

Use of ECETOC TRA Version 2 with modifications.

METHYLENE CHLORIDE

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC10	See section 2.3, Indoor use.	Worker - inhalative, long-term - systemic	30ppm	0.3
PROC10	See section 2.3, Indoor use.	Worker - dermal, long-term - systemic	5.49mg/kg/day	0.001
PROC10	See section 2.3, Outdoor use.	Worker - inhalative, long-term - systemic	21ppm	0.2
PROC10	See section 2.3, Outdoor use.	Worker - dermal, long-term - systemic	5.49mg/kg/day	0.001
PROC10	See section 2.4, Indoor use.	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC10	See section 2.4, Indoor use.	Worker - dermal, long-term - systemic	5.49mg/kg/day	0.001
PROC10	See section 2.4, Outdoor use.	Worker - inhalative, long-term - systemic	35ppm	0.4
PROC10	See section 2.4, Outdoor use.	Worker - dermal, long-term - systemic	5.49mg/kg/day	0.001
PROC11	See section 2.4, Indoor use.	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC11	See section 2.4, Indoor use.	Worker - dermal, long-term - systemic	21.43mg/kg/day	0.005
PROC11	See section 2.4, Outdoor use.	Worker - inhalative, long-term - systemic	35ppm	0.4
PROC11	See section 2.4, Outdoor use.	Worker - dermal, long-term - systemic	21.43mg/kg/day	0.005
PROC13	See section 2.6	Worker - inhalative, long-term - systemic	25ppm	0.3
PROC13	See section 2.6	Worker - dermal, long-term - systemic	2.74mg/kg/day	0.001
PROC11	See section 2.5, Indoor use.	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC11	See section 2.5, Indoor use.	Worker - dermal, long-term - systemic	21.43mg/kg/day	0.005
PROC11	See section 2.5, Outdoor use.	Worker - inhalative, long-term - systemic	35ppm	0.4
PROC11	See section 2.5, Outdoor use.	Worker - dermal, long-term - systemic	21.43mg/kg/day	0.005

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 9: Use as Functional Fluids		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Chemical product category	PC16: Heat transfer fluids	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises	
Environmental Release Categories	ERC7: Industrial use of substances in closed systems	
2.1 Contributing scenario controlling environmental exposure for: ERC7		
Amount used	Regional use tonnage (tons/year):	257 ton(s)/year
	Fraction of Regional tonnage used locally:	0.04
	Maximum daily site tonnage (kg/day):	500 kg
	Annual site tonnage (tons/year):	10 ton(s)/year
Frequency and duration of use	Continuous exposure	20 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.01
	Emission or Release Factor: Water	1 .10-3
	Emission or Release Factor: Soil	1 .10-3
	Indoor. Outdoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	No soil emission controls required, Required removal efficiency is 0%
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems) Continuous process	Handle substance within a closed system.(PROC1)
	General exposures (closed systems) with sample collection	Handle substance within a closed system.(PROC2)
	General exposures (closed systems) Use in contained batch processes	Handle substance within a predominantly closed system provided with extract ventilation.(PROC3)
	Batch process	Provide extract ventilation to points where emissions occur.(PROC4)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC7	---	Fresh water	PEC	0.0065mg/L	0.012
ERC7	---	Marine water	PEC	0.0006mg/L	0.00287
ERC7	---	Fresh water sediment	PEC	0.0121mg/kg	0.012
ERC7	---	Marine sediment	PEC	0.0010mg/kg	0.00287
ERC7	---	Soil	PEC	0.0019mg/kg	0.00361
ERC7	---	Sewage treatment plant (STP)	PEC	0.017mg/L	0.000656

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0.01ppm	0.0001
PROC1	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001
PROC2	---	Worker - inhalative, long-term - systemic	50ppm	0.50
PROC2	---	Worker - dermal, long-	0.27mg/kg/day	0.00006

		term - systemic		
PROC3	---	Worker - inhalative, long-term - systemic	10ppm	0.10
PROC3	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001
PROC4	---	Worker - inhalative, long-term - systemic	10ppm	0.10
PROC4	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 10: Use in laboratories		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Sectors of end-use	SU24: Scientific research and development	
Chemical product category	PC21: Laboratory chemicals	
Process categories	PROC10: Roller application or brushing PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Amount used	Regional use tonnage (tons/year):	257 ton(s)/year
	Fraction of Regional tonnage used locally:	0.002
	Maximum daily site tonnage (kg/day):	704 kg
	Annual site tonnage (tons/year):	257 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.5
	Emission or Release Factor: Water	0.5
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	No soil emission controls required, Required removal efficiency is 0%
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %
2.2 Contributing scenario controlling worker exposure for: PROC10, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of	liquid

	use)	
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	4 hours/day(PROC10)
	Frequency of use	8 hours/day(PROC15)
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Rolling, Brushing cleaning Degreasing small objects in cleaning station	Provide extract ventilation to points where emissions occur.(PROC10)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0.0058mg/L	0.011
ERC8a	---	Marine water	PEC	0.0005mg/L	0.00248
ERC8a	---	Fresh water sediment	PEC	0.010mg/kg	0.011
ERC8a	---	Marine sediment	PEC	0.0009mg/kg	0.00248
ERC8a	---	Soil	PEC	0.0010mg/kg	0.00199
ERC8a	---	Sewage treatment plant (STP)	PEC	0.0091mg/L	0.000353

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC10	---	Worker - inhalative, long-term - systemic	60ppm	0.6
PROC10	---	Worker - dermal, long-term - systemic	5.49mg/kg/day	0.0012
PROC15	---	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC15	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 11: Use as blowing agents		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC12: use of blowing agents in manufacture of foam	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Amount used	Regional use tonnage (tons/year):	955 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Maximum daily site tonnage (kg/day):	3183 kg
	Annual site tonnage (tons/year):	955 ton(s)/year
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	1
	Emission or Release Factor: Water	1 .10-3
	Emission or Release Factor: Soil	0
	Indoor. Outdoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	No soil emission controls required, Required removal efficiency is 0%
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8b, PROC9, PROC12		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Production of foam-based objects General exposures (closed systems) Continuous process with sample collection Use in contained batch processes	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	Production of foam-based objects Drum and small package filling Dedicated facility	Provide extract ventilation to points where emissions occur.(PROC9)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0.015mg/L	0.028
ERC4	---	Marine water	PEC	0.0014mg/L	0.00732
ERC4	---	Fresh water sediment	PEC	0.027mg/kg	0.028
ERC4	---	Marine sediment	PEC	0.0026mg/kg	0.00732
ERC4	---	Soil	PEC	0.048mg/kg	0.093
ERC4	---	Sewage treatment plant (STP)	PEC	0.103mg/L	0.00398

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0.01ppm	0.0001

PROC1	---	Worker - dermal, long-term - systemic	0.04mg/kg/day	0.00001
PROC2	---	Worker - inhalative, long-term - systemic	30ppm	0.30
PROC2	---	Worker - dermal, long-term - systemic	0.16mg/kg/day	0.00003
PROC3	---	Worker - inhalative, long-term - systemic	60ppm	0.60
PROC3	---	Worker - dermal, long-term - systemic	0.04mg/kg/day	0.00001
PROC4	---	Worker - inhalative, long-term - systemic	60ppm	0.60
PROC4	---	Worker - dermal, long-term - systemic	0.82mg/kg/day	0.0002
PROC8b	---	Worker - inhalative, long-term - systemic	90ppm	0.90
PROC8b	---	Worker - dermal, long-term - systemic	0.82mg/kg/day	0.0002
PROC9	---	Worker - inhalative, long-term - systemic	12ppm	0.1
PROC9	---	Worker - dermal, long-term - systemic	0.82mg/kg/day	0.0002
PROC12	---	Worker - inhalative, long-term - systemic	60ppm	0.6
PROC12	---	Worker - dermal, long-term - systemic	0.04mg/kg/day	0.00001

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 12: Use as extraction agent and/or processing aid		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU5: Manufacture of textiles, leather, fur SU9: Manufacture of fine chemicals	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC10: Roller application or brushing PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Process solvent		
Amount used	Regional use tonnage (tons/year):	2410 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Maximum daily site tonnage (kg/day):	24100 kg
	Annual site tonnage (tons/year):	2410 ton(s)/year
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.669
	Emission or Release Factor: Water	1.54 .10-3
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d

	Degradation efficiency	93.5 %

2.2 Contributing scenario controlling environmental exposure for: ERC4

Extraction medium - large sites

Amount used	Regional use tonnage (tons/year):	13400 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Maximum daily site tonnage (kg/day):	36712 kg
	Annual site tonnage (tons/year):	13400 ton(s)/year
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	7.06 .10-4
	Emission or Release Factor: Water	5.29 .10-3
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %

2.3 Contributing scenario controlling environmental exposure for: ERC4

Extraction medium - small sites

Amount used	Regional use tonnage (tons/year):	13400 ton(s)/year
	Fraction of Regional tonnage used locally:	0.287
	Maximum daily site tonnage (kg/day):	38460 kg

	Annual site tonnage (tons/year):	3846 ton(s)/year
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.114
	Emission or Release Factor: Water	0.095
	Emission or Release Factor: Soil	0
	Indoor.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Degradation efficiency	93.5 %

2.4 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC10, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 100 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Indoor use.	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems) Continuous process with sample collection	Handle substance within a closed system.(PROC1, PROC2)
	General exposures (closed systems) Use in contained batch processes	Handle substance within a predominantly closed system provided with extract ventilation.(PROC3)
	Batch process	Provide extract ventilation to points where emissions occur.(PROC4)
	Laboratory activities	Provide extract ventilation to points where

	Rolling, Brushing	emissions occur.(PROC10)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	See section 2.1	Fresh water	PEC	0.082mg/L	0.153
ERC4	See section 2.1	Marine water	PEC	0.0082mg/L	0.042
ERC4	See section 2.1	Fresh water sediment	PEC	0.149mg/kg	0.153
ERC4	See section 2.1	Marine sediment	PEC	0.0149mg/kg	0.042
ERC4	See section 2.1	Soil	PEC	0.126mg/kg	0.245
ERC4	See section 2.1	Sewage treatment plant (STP)	PEC	0.776mg/L	0.030
ERC4	See section 2.2	Fresh water	PEC	0.011mg/L	0.021
ERC4	See section 2.2	Marine water	PEC	0.0010mg/L	0.00531
ERC4	See section 2.2	Fresh water sediment	PEC	0.020mg/kg	0.021
ERC4	See section 2.2	Marine sediment	PEC	0.0019mg/kg	0.00531
ERC4	See section 2.2	Soil	PEC	0.0075mg/kg	0.015
ERC4	See section 2.2	Sewage treatment plant (STP)	PEC	0.064mg/L	0.00247
ERC4	See section 2.3	Fresh water	PEC	0.185mg/L	0.343
ERC4	See section 2.3	Marine water	PEC	0.018mg/L	0.093
ERC4	See section 2.3	Fresh water sediment	PEC	0.334mg/kg	0.343
ERC4	See section 2.3	Marine sediment	PEC	0.033mg/kg	0.093
ERC4	See section 2.3	Soil	PEC	0.211mg/kg	0.411
ERC4	See section 2.3	Sewage treatment plant (STP)	PEC	1.81mg/L	0.070

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0.01ppm	0.0001
PROC1	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001
PROC2	---	Worker - inhalative, long-term - systemic	50ppm	0.50
PROC2	---	Worker - dermal, long-term - systemic	0.27mg/kg/day	0.00006

PROC3	---	Worker - inhalative, long-term - systemic	10ppm	0.10
PROC3	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001
PROC4	---	Worker - inhalative, long-term - systemic	10ppm	0.10
PROC4	---	Worker - dermal, long-term - systemic	1.37mg/kg/day	0.0003
PROC10	---	Worker - inhalative, long-term - systemic	25ppm	0.25
PROC10	---	Worker - dermal, long-term - systemic	5.49mg/kg/day	0.001
PROC15	---	Worker - inhalative, long-term - systemic	50ppm	0.5
PROC15	---	Worker - dermal, long-term - systemic	0.07mg/kg/day	0.00001

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.