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

1.1. Product identifier

Code:	**57053001-57055001**
Product name	**SARATOGA UNOPIU'**
Chemical name and synonym	**ADHESIVES**

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

Intended use	**CONTACT ADHESIVE.**
Uses advised against	**This product is not recommended for all those industrial, professional or consumer uses not specifically identified on the label.**

1.3. Details of the supplier of the safety data sheet

Name	**SARATOGA INT. SFORZA SPA**
Full address	**Via Edison 76**
District and Country	**20090 Trezzano s/Naviglio (MI)**
	tel. 0039-02 445731
	fax 0039-02 4452742
e-mail address of the competent person	
responsible for the Safety Data Sheet	**trading@saratogasforza.com**

1.4. Emergency telephone number

For urgent inquiries refer to

CAV - Ospedale Pediatrico "Bambino Gesù" - Roma - Tel. +39 06 68593726 (h24)
CAV - Azienda Ospedaliero-Universitaria Foggia - Foggia - Tel. +39 0881 732326 (h24)
CAV - Azienda Ospedaliera "A. Cardarelli" - Napoli - Tel. +39 081 7472870 (h24)
CAV - Policlinico "Umberto I" - Roma - Tel. +39 06 4450618 (h24)
CAV - Policlinico "A. Gemelli" - Roma - Tel. +39 06 3054343 (h24)
CAV - Azienda Ospedaliera "Careggi" U.O. Tossicologia Medica - Firenze - Tel. +39 055 7947819(h24)
CAV - Centro Nazionale di Informazione Tossicologica - Pavia - Tel. +39 0382 24444 (h24)
CAV - Ospedale "Niguarda Ca' Granda" - Milano - Tel. +39 02 66101029 (h24)
CAV - Azienda Ospedaliera "Papa Giovanni XXIII" - Bergamo - Tel. +39 800 883300 (h24)

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2015/830.
Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Flammable liquid, category 2	H225	Highly flammable liquid and vapour.
Eye irritation, category 2	H319	Causes serious eye irritation.
Specific target organ toxicity - single exposure, category 3	H336	May cause drowsiness or dizziness.

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:

Signal words: Danger

Hazard statements:

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
EUH066	Repeated exposure may cause skin dryness or cracking.

Precautionary statements:

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261	Avoid breathing vapours.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing / eye protection / face protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P405	Store locked up.
P501	Dispose of contennts/container to authorized collection point.

Contains: ETHYL ACETATE

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.1. Substances

Information not relevant

3.2. Mixtures

Contains:

Identification	**x = Conc. %**	**Classification 1272/2008 (CLP)**
ETHYL ACETATE		
CAS 141-78-6	60 ≤ x < 85	Flam. Liq. 2 H225, Eye Irrit. 2 H319, STOT SE 3 H336, EUH066
EC 205-500-4		
INDEX 607-022-00-5		
Reg. no. 01-2119475103-46		

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 15 minutes, opening the eyelids fully. If problem persists, seek medical advice.
SKIN: Remove contaminated clothing. Wash immediately with plenty of water. If irritation persists, get medical advice/attention. Wash contaminated clothing before using it again.
INHALATION: Remove to open air. In the event of breathing difficulties, get medical advice/attention immediately.
INGESTION: Get medical advice/attention. Induce vomiting only if indicated by the doctor. Never give anything by mouth to an unconscious person, unless authorised by a doctor.

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

Specific information on symptoms and effects caused by the product are unknown.

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

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT
Extinguishing substances are: carbon dioxide, foam, chemical powder. For product loss or leakage that has not caught fire, water spray can be used to disperse flammable vapours and protect those trying to stem the leak.
UNSUITABLE EXTINGUISHING EQUIPMENT
Do not use jets of water. Water is not effective for putting out fires but can be used to cool containers exposed to flames to prevent explosions.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE
Excess pressure may form in containers exposed to fire at a risk of explosion. Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION
Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS
Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Block the leakage if there is no hazard.
Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

Send away individuals who are not suitably equipped. Eliminate all sources of ignition (cigarettes, flames, sparks, etc.) from the leakage site.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product into a suitable container. If the product is flammable, use explosion-proof equipment. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.
Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Keep away from heat, sparks and naked flames; do not smoke or use matches or lighters. Vapours may catch fire and an explosion may occur; vapour accumulation is therefore to be avoided by leaving windows and doors open and ensuring good cross ventilation. Without adequate ventilation, vapours may accumulate at ground level and, if ignited, catch fire even at a distance, with the danger of backfire. Avoid bunching of electrostatic charges. When performing transfer operations involving large containers, connect to an earthing system and wear antistatic footwear. Vigorous stirring and flow through the tubes and equipment may cause the formation and accumulation of electrostatic charges. In order to avoid the risk of fires and explosions, never use compressed air when handling. Open containers with caution as they may be pressurised. Do not eat, drink or smoke during use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container. Store the containers sealed, in a well ventilated place, away from direct sunlight. Store in a well ventilated place, keep far away from sources of heat, naked flames and sparks and other sources of ignition. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

See the exposure scenarios attached to this safety datasheet.
Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Regulatory References:

CZE		
	Česká Republika	Nařízení vlády č. 361/2007 Sb. kterým se stanoví podmínky ochrany zdraví při práci
DEU		
	Deutschland	TRGS 900 (Fassung 4.11.2016) - Liste der Arbeitsplatzgrenzwerte und Kurzzeitwerte
ESP		
	España	INSHT - Límites de exposición profesional para agentes químicos en España 2017
FRA	France	JORF n°0109 du 10 mai 2012 page 8773 texte n° 102
GBR	United Kingdom	EH40/2005 Workplace exposure limits

HRV	Hrvatska	NN13/09 - Ministarstvo gospodarstva, rada i poduzetništva
HUN	Magyarország	50/2011. (XII. 22.) NGM rendelet a munkahelyek kémiai biztonságáról
POL	Polska	ROZPORZĄDZENIE MINISTRA PRACY I POLITYKI SPOŁECZNEJ z dnia 7 czerwca 2017 r
ROU	România	Monitorul Oficial al României 44; 2012-01-19
EU	OEL EU	Directive (EU) 2017/2398; Directive (EU) 2017/164; Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC; Directive 91/322/EEC.
	TLV-ACGIH	ACGIH 2017

ETHYL ACETATE

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
TLV	CZE	700		900	
AGW	DEU	1500	400	3000	800
MAK	DEU	1500	400	3000	800
VLA	ESP	1460	400		
VLEP	FRA	1400	400		
WEL	GBR		200		400
GVI	HRV		200		400
AK	HUN	1400		1400	
NDS	POL	734		1468	
TLV	ROU	400	111	500	139
OEL	EU	734	200	1468	400
TLV-ACGIH		1441	400		

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,24	mg/l
Normal value in marine water	0,02	mg/l
Normal value for fresh water sediment	1,15	mg/kg/d
Normal value for marine water sediment	0,115	mg/kg/d
Normal value of STP microorganisms	650	mg/l
Normal value for the food chain (secondary poisoning)	0,2	g/kg
Normal value for the terrestrial compartment	0,148	mg/kg/d

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic		Chronic systemic	Chronic local			Chronic systemic
Oral				4,5 mg/kg bw/d				
Inhalation	734 mg/m3	734 mg/m3	367 mg/m3	367 mg/m3	1468 mg/m3	1468 mg/m3	734 mg/m3	734 mg/kg
Skin				37 mg/kg bw/d				63 mg/kg bw/d

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.

VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

TLV of solvent mixture: 1441 mg/m3

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.
When choosing personal protective equipment, ask your chemical substance supplier for advice.
Personal protective equipment must be CE marked, showing that it complies with applicable standards.

When choosing risk management measures and operating conditions, consult the exposition scenarios attached.

Provide an emergency shower with face and eye wash station.

HAND PROTECTION
Protect hands with category III work gloves (see standard EN 374).
The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.
The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION
Wear category I professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

Consider the appropriateness of providing antistatic clothing in the case of working environments in which there is a risk of explosion.

EYE PROTECTION
Wear airtight protective goggles (see standard EN 166).

RESPIRATORY PROTECTION
If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, wear a mask with a type AX filter, whose limit of use will be defined by the manufacturer (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.
Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.
If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

For information on controlling environmental exposure, see the exposure scenarios attached to this safety datasheet.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	dense liquid
Colour	transparent
Odour	characteristic of solvent
Odour threshold	Not available
pH	Not available
Melting point / freezing point	Not available
Initial boiling point	55 °C
Boiling range	Not available
Flash point	-15 °C
Evaporation Rate	Not available
Flammability of solids and gases	Not available
Lower inflammability limit	2,1 % (V/V)

Upper inflammability limit	13 % (V/V)
Lower explosive limit	Not available
Upper explosive limit	Not available
Vapour pressure	233 mmHg
Vapour density	Not available
Relative density	0,99
Solubility	soluble in organic solvents
Partition coefficient: n-octanol/water	Not available
Auto-ignition temperature	460 °C
Decomposition temperature	Not available
Viscosity	3300 C.p.s a 25°C
Explosive properties	Not available
Oxidising properties	Not available

9.2. Other information

Total solids (250°C / 482°F)	33,50 %			
VOC (Directive 2010/75/EC) :	66,47 %	-	660,05	g/litre
VOC (volatile carbon) :	36,21 %	-	359,58	g/litre

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

ETHYL ACETATE
Decomposes slowly into acetic acid and ethanol under the effect of light, air and water.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

The vapours may also form explosive mixtures with the air.

ETHYL ACETATE
Risk of explosion on contact with: alkaline metals,hydrides,oleum.May react violently with: fluorine,strong oxidising agents,chlorosulphuric acid,potassium tert-butoxide.Forms explosive mixtures with: air.

10.4. Conditions to avoid

Avoid overheating. Avoid bunching of electrostatic charges. Avoid all sources of ignition.

ETHYL ACETATE
Avoid exposure to: light,sources of heat,naked flames.

10.5. Incompatible materials

ETHYL ACETATE
Incompatible with: acids,bases,strong oxidants,aluminium,nitrates,chlorosulphuric acid.Incompatible materials: plastic materials.

10.6. Hazardous decomposition products

In the event of thermal decomposition or fire, gases and vapours that are potentially dangerous to health may be released.

SECTION 11. Toxicological information

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.
It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:
Not classified (no significant component)
LD50 (Oral) of the mixture:
Not classified (no significant component)
LD50 (Dermal) of the mixture:
Not classified (no significant component)

ETHYL ACETATE

LD50 (Oral) 4934 mg/kg dw ratto

LD50 (Dermal) > 20000 mg/kg-bw coniglio

SKIN CORROSION / IRRITATION

Repeated exposure may cause skin dryness or cracking.
Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Causes serious eye irritation

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

May cause drowsiness or dizziness

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class Viscosity: 3300 C.p.s a 25°C

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

ETHYL ACETATE	
LC50 - for Fish	230 mg/l/96h Pimephales promelas
EC50 - for Crustacea	165 mg/l/48h Daphnia magna
Chronic NOEC for Crustacea	2,4 mg/l Daphnia pulex
Chronic NOEC for Algae / Aquatic Plants	> 100 mg/l Scenedesmus subspicatus

12.2. Persistence and degradability

ETHYL ACETATE	
Solubility in water	> 10000 mg/l

Rapidly degradable

12.3. Bioaccumulative potential

ETHYL ACETATE	
Partition coefficient: n-octanol/water	0,68
BCF	30

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
Waste transportation may be subject to ADR restrictions.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

14.1. UN number

ADR / RID, IMDG, IATA:	1133

14.2. UN proper shipping name

ADR / RID:	ADHESIVES
IMDG:	ADHESIVES
IATA:	ADHESIVES

14.3. Transport hazard class(es)

ADR / RID:	Class: 3	Label: 3
IMDG:	Class: 3	Label: 3
IATA:	Class: 3	Label: 3

14.4. Packing group

ADR / RID, IMDG, IATA:	II

14.5. Environmental hazards

ADR / RID:	NO
IMDG:	NO
IATA:	NO

14.6. Special precautions for user

ADR / RID:	HIN - Kemler: 33	Limited Quantities: 5 L	Tunnel restriction code: (D/E)
	Special Provision: 640D		
IMDG:	EMS: F-E, S-D	Limited Quantities: 5 L	
IATA:	Cargo:	Maximum quantity: 60 L	Packaging instructions: 364
	Pass.:	Maximum quantity: 5 L	Packaging instructions: 353
	Special Instructions:	A3	

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

Information not relevant

SECTION 15. Regulatory information

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

Seveso Category - Directive 2012/18/EC: P5c

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006

Product
Point 3 - 40

Substances in Candidate List (Art. 59 REACH)

On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisarion (Annex XIV REACH)

None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None

Substances subject to the Rotterdam Convention:

None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

15.2. Chemical safety assessment

A chemical safety assessment has been performed for the following contained substances

ETHYL ACETATE

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Flam. Liq. 2	Flammable liquid, category 2
Eye Irrit. 2	Eye irritation, category 2
STOT SE 3	Specific target organ toxicity - single exposure, category 3
H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
EUH066	Repeated exposure may cause skin dryness or cracking.

LEGEND:
- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY
1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:
The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.
This document must not be regarded as a guarantee on any specific product property.
The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.
Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:
The following sections were modified:
01 / 02.

Exposition Scenarios

Substance	ETHYL ACETATE
Scenario Title	ETHYL ACETATE BRENNTAG
Revision nr.	2
File	EN_Acetato di etile_2.pdf

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	Distribution of substance	3	8, 9	NA	1, 2, 8a, 8b, 9, 15	2	NA	ES1393
2	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 15	2	NA	ES1391
3	Use in Cleaning Agents	3	NA	NA	2, 3, 4, 7, 8a, 8b, 10, 13	4	NA	ES13890
4	Use in Cleaning Agents	22	NA	NA	2, 3, 4, 8a, 8b, 10, 11, 13	8a	NA	ES13892
5	Use as lubricants	3	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 9, 10, 13, 17, 18	4, 7	NA	ES13894
6	Use as lubricants	22	NA	NA	1, 2, 3, 4, 8a, 8b, 9, 10, 11, 13, 17, 18, 20	8a	NA	ES13896
7	Use in laboratories	3	NA	NA	15	4	NA	ES1402
8	Use in laboratories	22	NA	NA	15	8a	NA	ES1406
9	Use as extraction agent and/or processing aid	3	9	NA	1, 2, 3, 4, 8a, 8b	1	NA	ES1395
10	Uses in coatings	22	NA	NA	1, 2, 8a, 8b, 10, 11, 13, 19	8a, 8d	NA	ES1404
11	Use in agrochemicals	22	NA	NA	2, 4, 8a, 8b, 11, 13	8a, 8c, 8d, 8f	NA	ES8752
12	Uses in coatings	21	NA	1, 9a	NA	8a	NA	ES1408
13	Uses in coatings	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 10, 13, 15, 9, 14	4	NA	ES18795

1. Short title of Exposure Scenario 1: Distribution 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 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		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Annual site tonnage (tons/year):	30000 tonnes
	Daily amount per site	100 tonnes
	Fraction used at the main local source.	1
	Annually total	30000 tonnes
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	2 %
	Emission or Release Factor: Water	10 %
	Emission or Release Factor: Soil	0 %
	Outdoor use.	
	Processing temperature: Ambient temperature	
	Processing pressure: Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit	Air	Containment should be used to minimize releases to air., Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental

discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		legislation
	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 87 %)
	Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	87 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Hazardous waste incineration., Dispose for use in recycled fuels.
	Disposal methods	Dispose of waste product or used containers according to local regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, 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	98 hPa
Amount used	n.a. in tier 1 TRA MODEL	
Frequency and duration of use	Frequency of use	< 240 days/year
	Frequency of use	> 4 days/week
	Exposure duration per day	> 240 min
	Exposure duration per day	60 - 240 min(PROC8a)
Human factors not influenced by risk management	Exposed skin areas	Two hands 960 cm²
Other operational conditions affecting workers exposure	Outdoor or in highly ventilated (open) spaces	
	Indoor use.(PROC8b, PROC9)	
Technical conditions and measures to control dispersion from source towards the worker	General exposures Continuous process	Handle substance within a closed system.(PROC1)
	General exposures Continuous process with sample collection	Handle substance within a closed system.(PROC2)
	Bulk transfers Non-dedicated facility	Use drum pumps or carefully pour from container. Locate bulk storage outdoors.(PROC8a)

	Bulk transfers Dedicated facility	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide extract ventilation to material transfer points and other openings. Clear transfer lines prior to de-coupling. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Locate bulk storage outdoors.(PROC8b)
	Drum/batch transfers Filling / preparation of equipment from drums or containers Bulk weighing	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide extract ventilation to material transfer points and other openings.(PROC9)
	Laboratory activities	Handle in a fume cupboard or under extract ventilation.(PROC15)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN374) and eye protection. Butyl rubber gloves offer good protection	

3. Exposure estimation and reference to its source

Environment

ERC2: EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	Fresh water	PEC	0,179mg/L	0,688
ERC2	---	Marine water	PEC	0,018mg/L	0,688
ERC2	---	Fresh water sediment	PEC	0,239mg/kg	0,854
ERC2	---	Marine sediment	PEC	0,024mg/kg	0,085
ERC2	---	Soil	PEC	0,002mg/kg	0,009
ERC2	---	Sewage treatment plant (STP)	PEC	1,77mg/L	0,003
ERC2	---	Total daily intake via local environment	PEC	0,005mg/kg bw/day	< 0,001

Workers

PROC1, PROC2, PROC8a, PROC8b, PROC9, PROC15: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0,026mg/m³	< 0,001
PROC1	---	Worker - dermal, long-	0,34mg/kg bw/day	0,0054

		term - systemic		
PROC2	---	Worker - inhalative, long-term - local	128,48mg/m³	0,18
PROC2	---	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,022
PROC8a	---	Worker - inhalative, long-term - local	385,44mg/m³	0,53
PROC8a	---	Worker - dermal, long-term - systemic	2,74mg/kg bw/day	0,044
PROC8b	---	Worker - inhalative, long-term - local	9,91mg/m³	0,014
PROC8b	---	Worker - dermal, long-term - systemic	0,69mg/kg bw/day	0,011
PROC9	---	Worker - inhalative, long-term - local	73,42mg/m³	0,1
PROC9	---	Worker - dermal, long-term - systemic	0,69mg/kg bw/day	0,011
PROC15	---	Worker - inhalative, long-term	50ppm	0,25
PROC15	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,005

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

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
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.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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: 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	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC2: Formulation of preparations	
2.1 Contributing scenario controlling environmental exposure for: ERC2		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Annual site tonnage (tons/year):	15000 tonnes
	Daily amount per site	50 tonnes
	Fraction used at the main local source.	0,4
	Annually total	60000 tonnes
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	0,5 %
	Emission or Release Factor: Water	0,3 %
	Emission or Release Factor: Soil	0,01 %
	Indoor use.	
Technical conditions and measures at process level	Air	Treatment of air emissions is not required for the purposes of REACH compliance but may be

(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		needed to comply with other environmental legislation
	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 87 %)
	Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	87 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Hazardous waste incineration., Dispose for use in recycled fuels., External treatment and disposal of waste should comply with applicable local and/or national regulations.
	Disposal methods	Dispose of waste product or used containers according to local regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, 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	98 hPa
Amount used	n.a. in tier 1 TRA MODEL	
Frequency and duration of use	Frequency of use	< 240 days/year
	Frequency of use	> 4 days/week
	Exposure duration per day	> 240 min
	Exposure duration per day	< 240 min(PROC8a, PROC8b)
Human factors not influenced by risk management	Exposed skin areas	Two hands 960 cm²
Other operational conditions affecting workers exposure	Indoor use.	
	Outdoor use.(PROC1)	
Technical conditions and measures to control dispersion from source towards the worker	General exposures Continuous process	Handle substance within a closed system.(PROC1)
	General exposures Continuous process	Ensure material transfers are under containment or extract ventilation.

with sample collection	Provide extraction ventilation at points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC2)
Bulk transfers Non-dedicated facility	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Use drum pumps or carefully pour from container. Locate bulk storage outdoors.(PROC8a)
Bulk transfers Dedicated facility	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Clear transfer lines prior to de-coupling. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Locate bulk storage outdoors.(PROC8b)
Drum/batch transfers Filling / preparation of equipment from drums or containers Bulk weighing	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC9)
General exposures Use in contained batch processes	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC3)
General exposures Use in contained batch processes with sample collection	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC4)
Mixing operations (open systems) Batch process	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC5)
Laboratory activities	Handle in a fume cupboard or under extract ventilation.(PROC15)

Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN374) and eye protection. Butyl rubber gloves offer good protection

3. Exposure estimation and reference to its source

Environment

ERC2: EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	Fresh water	PEC	0,144mg/L	0,554
ERC2	---	Marine water	PEC	0,0144mg/L	0,554
ERC2	---	Fresh water sediment	PEC	0,192mg/kg	0,686
ERC2	---	Marine sediment	PEC	0,019mg/kg	0,0685
ERC2	---	Soil	PEC	0,0015mg/kg	0,005
ERC2	---	Sewage treatment plant (STP)	PEC	1,416mg/L	0,0022
ERC2	---	Total daily intake via local environment	PEC	0,003mg/kg bw/day	< 0,001

Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0,03mg/m³	< 0,001
PROC1	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,0054
PROC2	---	Worker - inhalative, long-term - local	18,35mg/m³	0,025
PROC2	---	Worker - dermal, long-term - systemic	0,14mg/kg bw/day	0,0022
PROC3	---	Worker - inhalative, long-term - local	73,42mg/m³	0,10
PROC3	---	Worker - dermal, long-term - systemic	0,03mg/kg bw/day	< 0,001
PROC4	---	Worker - inhalative, long-term - local	73,42mg/m³	0,25
PROC4	---	Worker - dermal, long-term - systemic	0,69mg/kg bw/day	0,011
PROC5	---	Worker - inhalative, long-term - local	183,54mg/m³	0,301
PROC5	---	Worker - dermal, long-term - systemic	0,07mg/kg bw/day	0,0011
PROC8a	---	Worker - inhalative, long-	55,06mg/m³	0,075

		term - local		
PROC8a	---	Worker - dermal, long-term - systemic	0,14mg/kg bw/day	0,0022
PROC8b	---	Worker - inhalative, long-term - local	33,04mg/m³	0,075
PROC8b	---	Worker - dermal, long-term - systemic	0,69mg/kg bw/day	0,011
PROC9	---	Worker - inhalative, long-term - local	73,42mg/m³	0,10
PROC9	---	Worker - dermal, long-term - systemic	0,69mg/kg bw/day	0,011
PROC15	---	Worker - inhalative, long-term	50ppm	0,25
PROC15	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,005

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

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
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.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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: Use in Cleaning Agents		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
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 PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring	
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	Annual amount per site	25 ton(s)/year
	Daily amount per site	1200 kg/day
Frequency and duration of use	Continuous exposure	20 days/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	30 %
	Emission or Release Factor: Water	0,01 %
	Emission or Release Factor: Soil	0 %
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	Treat air emission to provide a typical removal efficiency of (%):
	Water	Do not release wastewater directly into environment., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):, If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements. Store all VOC-containing wastes in closed, secure containers (e.g., bulk tanks, intermediate bulk containers, drums)	
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	88 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, 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	> 10 kPa
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	Use in contained batch processes Treatment by heating	Provide extract ventilation to points where emissions occur.(PROC4)
	Filling / preparation of equipment from drums or containers	Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling.(PROC8a)
	Bulk transfers Dedicated facility	Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling.(PROC8b)
	Cleaning with low-pressure washers	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC10)
	Manual Surfaces cleaning No spraying	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC10)
	Degreasing small objects in cleaning station	Provide extract ventilation to points where emissions occur. Clear spills immediately.(PROC13)
Conditions and measures related to personal protection, hygiene and health evaluation	Cleaning with high pressure washers	Wear a respirator conforming to EN140 with Type A filter or better. Change filter cartridge on respirator daily.(PROC7)
	Cleaning with low-pressure washers	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Manual Surfaces cleaning No spraying	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)

3. Exposure estimation and reference to its source

Environment

ERC4: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC - local	0,00117mg/L	0,0045
ERC4	---	Fresh water sediment	PEC - local	0,00698mg/kg dry weight (d.w.)	0,00558
ERC4	---	Marine water	PEC - local	0,000132mg/L	0,00508
ERC4	---	Marine sediment	PEC - local	0,000784mg/kg dry weight (d.w.)	0,00627
ERC4	---	Soil	PEC - local	0,00114mg/kg dry weight (d.w.)	0,00691
ERC4	---	Sewage treatment plant (STP)	PEC	0,0625mg/L	0,000096
ERC4	---	---	Msafe	173000kg/day	---

ESVOC spERC 4.4a.v1 has been used to evaluate the exposure for the environment.

Workers

PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2, PROC8a, PROC13	---	Inhalation worker exposure	25ppm	0,125
PROC2, PROC8a, PROC13	---	Dermal worker exposure	1,371mg/kg/day	0,022
PROC3, PROC4, PROC7	---	Inhalation worker exposure	50ppm	0,25
PROC3, PROC4, PROC8b	---	Dermal worker exposure	0,686mg/kg/day	0,011
PROC7	---	Dermal worker exposure	42,86mg/kg/day	0,68
PROC8b	---	Inhalation worker exposure	4,5ppm	0,023
PROC10	---	Inhalation worker exposure	75ppm	0,375
PROC10	---	Dermal worker exposure	27,43mg/kg/day	0,435

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

Environment

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.
The following equation may be used for scaling:

$$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$

Where: mspERC: Substance use rate in spERC
EER,spERC: Efficacy of RMM in spERC
Frelease,spERC: Initial release fraction in spERC
DFspERC: spERC wastewater dilution factor

Msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease,site: Initial release fraction at site
DFsite: site-specific wastewater dilution factor
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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: Use in Cleaning Agents		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
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 PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring	
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	Annual amount per site	0,005 ton(s)/year
	Daily amount per site	0,013 kg/day
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	100 %
	Emission or Release Factor: Water	100 %
	Emission or Release Factor: Soil	0 %
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	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Prevent environmental discharge consistent with regulatory requirements. Store all VOC-containing wastes in closed, secure containers (e.g., bulk tanks, intermediate bulk containers, drums)	
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	88 %

Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13

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	> 10 kPa
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	Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products)	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC4)
	Application of cleaning products in closed systems Outdoor.	Ensure operation is undertaken outdoors.(PROC4)
	Cleaning of medical devices	Provide extract ventilation to points where emissions occur.(PROC4)
	Filling / preparation of equipment from drums or containers Outdoor.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a)
	Filling / preparation of equipment from drums or containers Dedicated facility	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC8b)
	Cleaning with low-pressure washers Rolling, Brushing No spraying	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC10)
	Manual Surfaces cleaning	Limit the substance content in the product to 5 %. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)
	Ad hoc manual application via trigger sprays, dipping, etc Rolling, Brushing	Provide extract ventilation to points where emissions occur.(PROC10)
	Cleaning with high pressure washers Spraying Indoor.	Limit the substance content in the product to 5 %. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC11)

	Cleaning with high pressure washers Spraying Outdoor.	Limit the substance content in the product to 1 %. Ensure operation is undertaken outdoors.(PROC11)
	Dipping, immersion and pouring Manual Surfaces cleaning	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC13)
Conditions and measures related to personal protection, hygiene and health evaluation	Filling / preparation of equipment from drums or containers Outdoor.	Wear a respirator conforming to EN140 with Type A filter or better. Change filter cartridge on respirator daily.(PROC8a)
	Ad hoc manual application via trigger sprays, dipping, etc Rolling, Brushing	Wear a respirator conforming to EN140 with Type A filter or better. Change filter cartridge on respirator daily.(PROC10)
	Cleaning with high pressure washers Spraying Outdoor.	Wear suitable gloves tested to EN374. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)

3. Exposure estimation and reference to its source

Environment

ERC8a: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC - local	0,00075mg/L	0,00288
ERC8a	---	Fresh water sediment	PEC - local	0,00448mg/kg dry weight (d.w.)	0,00358
ERC8a	---	Marine water	PEC - local	0,0000894mg/L	0,00344
ERC8a	---	Marine sediment	PEC - local	0,000533mg/kg dry weight (d.w.)	0,00426
ERC8a	---	Soil	PEC - local	0,000242mg/kg dry weight (d.w.)	0,00147
ERC8a	---	Sewage treatment plant (STP)	PEC	0,0274mg/L	0,000042
ERC8a	---	---	Msafe	3,05kg/day	---

Workers

PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	---	Inhalation worker exposure	30ppm	0,15
PROC2	---	Dermal worker exposure	0,822mg/kg/day	0,013
PROC3	---	Inhalation worker exposure	60ppm	0,30
PROC3	---	Dermal worker exposure	0,414mg/kg/day	0,007
PROC4	---	Inhalation worker exposure	52,5ppm	0,263
PROC4	---	Dermal worker exposure	4,116mg/kg/day	0,065
PROC8a	---	Inhalation worker exposure	21ppm	0,105
PROC8a, PROC8b, PROC13	---	Dermal worker exposure	8,226mg/kg/day	0,131
PROC8b, PROC13	---	Inhalation worker exposure	45ppm	0,225
PROC10	---	Inhalation worker exposure	90ppm	0,45
PROC10	---	Dermal worker exposure	16,458mg/kg/day	0,261
PROC11	---	Inhalation worker exposure	70ppm	0,35
PROC11	---	Dermal worker exposure	21,428mg/kg/day	0,34

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

Environment
Not applicable for wide dispersive uses.
Health
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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: Use as lubricants		
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 PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC17: Lubrication at high energy conditions and in partly open process PROC18: Greasing at high energy conditions	
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		
Amount used	Annual amount per site	25 ton(s)/year
	Daily amount per site	1250 kg/day
Frequency and duration of use	Continuous exposure	20 days/year
Environment factors not influenced by risk management	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	0,1 %
	Emission or Release Factor: Soil	0,1 %
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	Treat air emission to provide a typical removal efficiency of (%):
	Water	Do not release wastewater directly into environment., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):, If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.	

	Store all VOC-containing wastes in closed, secure containers (e.g., bulk tanks, intermediate bulk containers, drums)	
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	88 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18

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	> 10 kPa
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	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	Storage	Store substance within a closed system. Avoid dip sampling.(PROC2)
	General exposures (closed systems) Batch process with sample collection	Handle substance within a closed system.(PROC3)
	General exposures (open systems)	Provide extract ventilation to points where emissions occur.(PROC4)
	Spraying	Carry out in a vented booth or extracted enclosure. Automate activity where possible.(PROC7)
	Filling / preparation of equipment from drums or containers Non-dedicated facility	Use drum pumps. Transfer via enclosed lines.(PROC8a)
	Maintenance of small items	Drain down system prior to equipment break-in or maintenance. Avoid manual contact with wet work pieces. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Bulk transfers	Transfer via enclosed lines. Clear transfer lines prior to de-coupling. Ensure material transfers are under containment or extract ventilation. Clear spills immediately.

		Remotely vent displaced vapours.(PROC8b)
	Filling / preparation of equipment from drums or containers Dedicated facility	Transfer via enclosed lines. Clear transfer lines prior to de-coupling. Ensure material transfers are under containment or extract ventilation. Clear spills immediately. Remotely vent displaced vapours.(PROC8b)
	Maintenance (of larger plant items) and machine set up with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Maintenance (of larger plant items) and machine set up without local exhaust ventilation	Drain or remove substance from equipment prior to break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8b)
	Initial factory fill of equipment	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC9)
	Remanufacture of reject articles	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Ensure material transfers are under containment or extract ventilation. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC9)
	Rolling, Brushing Manual	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC10)
	Treatment by dipping and pouring	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Restrict area of openings to equipment. Allow time for product to drain from workpiece.(PROC13)
	Operation and lubrication of high energy open equipment	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC17, PROC18)
Conditions and measures related to personal protection, hygiene and health evaluation	Spraying	Wear a respirator conforming to EN140 with Type A filter or better. Change filter cartridge on respirator daily. Wear suitable gloves tested to EN374. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. Wear suitable coveralls to prevent exposure to the skin.(PROC7)

3. Exposure estimation and reference to its source

Environment

ERC4, ERC7: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4, ERC7	---	Fresh water	PEC - local	0,00792mg/L	0,0305
ERC4, ERC7	---	Fresh water sediment	PEC - local	0,0472mg/kg dry weight (d.w.)	0,0378
ERC4, ERC7	---	Marine water	PEC - local	0,00806mg/L	0,31
ERC4, ERC7	---	Marine sediment	PEC - local	0,00481mg/kg dry weight (d.w.)	0,0385
ERC4, ERC7	---	Soil	PEC - local	0,00356mg/kg dry weight (d.w.)	0,0216
ERC4, ERC7	---	Sewage treatment plant (STP)	PEC	0,625mg/L	0,000962
ERC4, ERC7	---	---	Msafe	4030kg/day	---

ESVOC spERC 4.4a.v1 has been used to evaluate the exposure for the environment.

Workers

PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Inhalation worker exposure	0,01ppm	< 0,001
PROC1	---	Dermal worker exposure	0,03mg/kg/day	< 0,001
PROC2	---	Inhalation worker exposure	25ppm	0,125
PROC2	---	Dermal worker exposure	1,37mg/kg/day	0,022
PROC3, PROC7, PROC8a	---	Inhalation worker exposure	50ppm	0,25
PROC3	---	Dermal worker exposure	0,69mg/kg/day	0,011
PROC4	---	Inhalation worker exposure	10ppm	0,05
PROC4, PROC9	---	Dermal worker exposure	6,86mg/kg/day	0,109
PROC7	---	Dermal worker exposure	8,572mg/kg/day	0,136
PROC8b	---	Inhalation worker exposure	30ppm	0,15
PROC8a, PROC8b, PROC13, PROC18	---	Dermal worker exposure	13,71mg/kg/day	0,218
PROC9	---	Inhalation worker exposure	60ppm	0,3
PROC10	---	Inhalation worker	75ppm	0,375

		exposure		
PROC10, PROC17	---	Dermal worker exposure	27,43mg/kg/day	0,435
PROC13	---	Inhalation worker exposure	87,5ppm	0,438
PROC17, PROC18	---	Inhalation worker exposure	5ppm	0,025

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

Environment
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.
The following equation may be used for scaling:

$$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$

Where: mspERC: Substance use rate in spERC
EER,spERC: Efficacy of RMM in spERC
Frelease,spERC: Initial release fraction in spERC
DFspERC: spERC wastewater dilution factor

Msite: Substance use rate at site
EER,site: Efficacy of RMM at site
Frelease,site: Initial release fraction at site
DFsite: site-specific wastewater dilution factor
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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: Use as lubricants		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
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) PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC17: Lubrication at high energy conditions and in partly open process PROC18: Greasing at high energy conditions PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems	
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	Annual amount per site	0,005 ton(s)/year
	Daily amount per site	0,013 kg/day
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	100 %
	Emission or Release Factor: Water	100 %
	Emission or Release Factor: Soil	0 %
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	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Prevent environmental discharge consistent with regulatory requirements. Store all VOC-containing wastes in closed, secure containers (e.g., bulk tanks, intermediate bulk containers, drums)	
Conditions and measures related to sewage treatment plant	Type of Sewage	Domestic sewage treatment plant

	Treatment Plant	
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	88 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20

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	> 10 kPa
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	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	Storage	Store substance within a closed system.(PROC2)
	General exposures (closed systems) Batch process with sample collection	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Handle substance within a closed system.(PROC3)
	General exposures (open systems)	Provide extract ventilation to points where emissions occur. Ensure material transfers are under containment or extract ventilation.(PROC4)
	Filling / preparation of equipment from drums or containers Non-dedicated facility	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Ensure operation is undertaken outdoors. Use drum pumps or carefully pour from container. Provide enhanced general ventilation by mechanical means.(PROC8a)
	Maintenance (of larger plant items) and machine set up	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Ensure operation is undertaken outdoors. Drain down system prior to equipment break-in or maintenance. Clear transfer lines prior to de-coupling.(PROC8a)
	Maintenance (of larger plant items) and machine set up Elevated temperature	Provide extract ventilation to points where emissions occur. Drain down system prior to equipment break-in or maintenance. Clear transfer lines prior to de-coupling.(PROC8a)
	Bulk transfers	Transfer via enclosed lines.

		Clear transfer lines prior to de-coupling. Handle substance within a closed system.(PROC8b)
	Filling / preparation of equipment from drums or containers Dedicated facility	Transfer via enclosed lines. Use drum pumps or carefully pour from container.(PROC8b)
	Maintenance of small items	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Drain or remove substance from equipment prior to break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC9)
	Rolling, Brushing Manual with local exhaust ventilation	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Provide extract ventilation to points where emissions occur.(PROC10)
	Spraying with local exhaust ventilation	Limit the substance content in the mixture to 25 %. Carry out in a vented booth or extracted enclosure.(PROC11)
	Spraying without local exhaust ventilation	Limit the substance content in the mixture to 25 %.(PROC11)
	Treatment by dipping and pouring	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Allow time for product to drain from workpiece.(PROC13)
	Operation and lubrication of high energy open equipment Indoor.	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC17, PROC18)
	Operation and lubrication of high energy open equipment Outdoor.	Limit the substance content in the product to 5 %. Ensure operation is undertaken outdoors.(PROC17)
	Restrict area of openings to equipment.(PROC20)	
Conditions and measures related to personal protection, hygiene and health evaluation	Rolling, Brushing Manual without local exhaust ventilation	Wear a respirator conforming to EN140 with Type A filter or better. Change filter cartridge on respirator daily.(PROC10)
	Spraying without local exhaust ventilation	Wear a respirator conforming to EN140 with Type A filter or better. Change filter cartridge on respirator daily. Wear suitable gloves tested to EN374. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.(PROC11)

3. Exposure estimation and reference to its source

Environment

ERC8a: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC - local	0,00075mg/L	0,00288
ERC8a	---	Fresh water sediment	PEC - local	0,00448mg/kg dry weight (d.w.)	0,00358
ERC8a	---	Marine water	PEC - local	0,0000894mg/L	0,00344
ERC8a	---	Marine sediment	PEC - local	0,000533mg/kg dry weight (d.w.)	0,00426
ERC8a	---	Soil	PEC - local	0,000242mg/kg dry weight (d.w.)	0,00147
ERC8a	---	Sewage treatment plant (STP)	PEC	0,0274mg/L	0,000042
ERC8a	---	---	Msafe	3,05kg/day	---

Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Inhalation worker exposure	0,01ppm	< 0,001
PROC1	---	Dermal worker exposure	0,03mg/kg/day	< 0,001
PROC2, PROC4, PROC8b, PROC18	---	Inhalation worker exposure	50ppm	0,25
PROC2, PROC4, PROC18	---	Dermal worker exposure	1,37mg/kg/day	0,022
PROC3, PROC10, PROC17	---	Inhalation worker exposure	70ppm	0,35
PROC3	---	Dermal worker exposure	0,69mg/kg/day	0,011
PROC8a	---	Inhalation worker exposure	80ppm	0,4
PROC8a, PROC8b, PROC13	---	Dermal worker exposure	13,71mg/kg/day	0,218
PROC9	---	Inhalation worker	15ppm	0,075

		exposure		
PROC9	---	Dermal worker exposure	6,86mg/kg/day	0,109
PROC10	---	Dermal worker exposure	27,43mg/kg/day	0,435
PROC11	---	Inhalation worker exposure	60ppm	0,3
PROC11	---	Dermal worker exposure	12,857mg/kg/day	0,204
PROC13	---	Inhalation worker exposure	75ppm	0,375
PROC17	---	Dermal worker exposure	5,486mg/kg/day	0,087
PROC20	---	Inhalation worker exposure	25ppm	0,125
PROC20	---	Dermal worker exposure	1,71mg/kg/day	0,027

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

Environment
Not applicable for wide dispersive uses.
Health
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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 laboratories		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	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		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Annual site tonnage (tons/year):	30 tonnes
	Daily amount per site	1000 kg
	Fraction used at the main local source.	0,01
	Annually total	3000 tonnes
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	100 %
	Emission or Release Factor: Water	100 %
	Emission or Release Factor: Soil	0 %
	Indoor use.	
	Processing temperature: Ambient temperature	
	Processing pressure: Ambient pressure.	
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	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation
	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., Do not release wastewater directly into environment.
	Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d

	Percentage removed from waste water	87 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: 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	98 hPa
Amount used	n.a. in tier 1 TRA MODEL	
Frequency and duration of use	Frequency of use	< 240 days/year
	Frequency of use	> 4 days/week
	Exposure duration per day	60 - 240 min
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm²
Other operational conditions affecting workers exposure	Indoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Conditions and measures related to personal protection, hygiene and health evaluation	Laboratory activities	Wear suitable gloves (tested to EN374) and eye protection.

3. Exposure estimation and reference to its source

Environment

ERC4: EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,0839mg/L	0,323
ERC4	---	Marine water	PEC	0,0084mg/L	0,323
ERC4	---	Fresh water sediment	PEC	0,1115mg/kg	0,398
ERC4	---	Marine sediment	PEC	0,0112mg/kg	0,040
ERC4	---	Soil	PEC	0,0002mg/kg	< 0,001
ERC4	---	Sewage treatment plant (STP)	PEC	0,8219mg/L	0,001
ERC4	---	Total daily intake via local environment	PEC	0,0021mg/kg bw/day	< 0,001

Workers

PROC15: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC15	---	Worker - inhalative, long-term - local	110,12mg/m³	0,151
PROC15	---	Worker - dermal, long-term - systemic	0,343mg/kg bw/day	0,005

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

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
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.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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 laboratories		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	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		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Annual site tonnage (tons/year):	30 tonnes
	Daily amount per site	2 kg
	Fraction used at the main local source.	0,01
	Annually total	3000 tonnes
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	100 %
	Emission or Release Factor: Water	100 %
	Emission or Release Factor: Soil	0 %
	Indoor use.	
	Processing temperature: Ambient temperature	
	Processing pressure: Ambient pressure.	
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	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation
	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., Do not release wastewater directly into environment.
	Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d

	Percentage removed from waste water	87 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: 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	98 hPa
Amount used	n.a. in tier 1 TRA MODEL	
Frequency and duration of use	Frequency of use	< 240 days/year
	Frequency of use	> 4 days/week
	Exposure duration per day	60 - 240 min
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm²
Other operational conditions affecting workers exposure	Indoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Conditions and measures related to personal protection, hygiene and health evaluation	Laboratory activities	Wear suitable gloves (tested to EN374) and eye protection.

3. Exposure estimation and reference to its source

Environment

ERC8a: EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,0839mg/L	0,323
ERC8a	---	Marine water	PEC	0,0084mg/L	0,323
ERC8a	---	Fresh water sediment	PEC	0,1115mg/kg	0,398
ERC8a	---	Marine sediment	PEC	0,0112mg/kg	0,040
ERC8a	---	Soil	PEC	0,0002mg/kg	< 0,001
ERC8a	---	Sewage treatment plant (STP)	PEC	0,8219mg/L	0,001
ERC8a	---	Total daily intake via local environment	PEC	0,0021mg/kg bw/day	< 0,001

Workers

PROC15: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC15	---	Worker - inhalative, long-term - local	110,12mg/m³	0,151
PROC15	---	Worker - dermal, long-term - systemic	0,343mg/kg bw/day	0,005

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

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
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.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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 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	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	
Environmental Release Categories	ERC1: Manufacture of substances	
2.1 Contributing scenario controlling environmental exposure for: ERC1		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Annual site tonnage (tons/year):	300 tonnes
	Daily amount per site	1 tonnes
	Fraction used at the main local source.	0,1
	Annually total	3000 tonnes
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	0,5 %
	Emission or Release Factor: Water	1 %
	Emission or Release Factor: Soil	0,01 %
	Indoor use.	
	Processing temperature: Ambient temperature	
	Processing pressure: Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Air	Use containment measures to reduce fugitive emissions., Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation, Use appropriate emission

releases to soil Organizational measures to prevent/limit release from the site		abatement equipment from LEV systems if required by local legislation.
	Keep container tightly closed. Store in a bounded area.	
	Water	Onsite wastewater treatment required, Do not release wastewater directly into environment.
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 87 %)
	Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	87 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Hazardous waste incineration., Dispose for use in recycled fuels.
	Disposal methods	Dispose of waste product or used containers according to local regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b		
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	98 hPa
Amount used	n.a. in tier 1 TRA MODEL	
Frequency and duration of use	Frequency of use	< 240 days/year
	Frequency of use	> 4 days/week
	Exposure duration per day	> 240 min(PROC3, PROC4)
	Exposure duration per day	60 - 240 min(PROC8a, PROC8b)
Human factors not influenced by risk management	Exposed skin areas	Palms of both hands 480 cm² (PROC3, PROC4)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC8b)
Other operational conditions affecting workers exposure	Indoor use.	
Technical conditions and measures to control dispersion from source towards the worker	General exposures Use in contained batch processes	Handle substance within a predominantly closed system provided with extract ventilation. Ensure material transfers are under containment or extract ventilation.

		Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC3)
	General exposures Use in contained batch processes with sample collection	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC4)
	Bulk transfers Non-dedicated facility	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Use drum pumps or carefully pour from container. Locate bulk storage outdoors.(PROC8a)
	Bulk transfers Dedicated facility	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Clear transfer lines prior to de-coupling. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Locate bulk storage outdoors.(PROC8b)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN374) and eye protection. Butyl rubber gloves offer good protection	

3. Exposure estimation and reference to its source

Environment

ERC1: EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC1	---	Fresh water	PEC	0,0106mg/L	0,041
ERC1	---	Marine water	PEC	0,0010mg/L	0,041
ERC1	---	Fresh water sediment	PEC	0,0141mg/kg	0,050
ERC1	---	Marine sediment	PEC	0,0014mg/kg	0,005
ERC1	---	Soil	PEC	0,0031mg/kg	0,014
ERC1	---	Sewage treatment plant (STP)	PEC	0,0778mg/L	< 0,001
ERC1	---	Total daily intake via local environment	PEC	0,0004mg/kg bw/day	< 0,001

Workers

PROC3, PROC4, PROC8a, PROC8b: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC3	---	Worker - inhalative, long-term - local	36,71mg/m³	0,050
PROC3	---	Worker - dermal, long-term - systemic	0,03mg/kg bw/day	< 0,001
PROC4	---	Worker - inhalative, long-term - local	36,71mg/m³	0,050
PROC4	---	Worker - dermal, long-term - systemic	0,69mg/kg bw/day	0,011
PROC8a	---	Worker - inhalative, long-term - local	55,06mg/m³	0,075
PROC8a	---	Worker - dermal, long-term - systemic	0,14mg/kg bw/day	0,0022
PROC8b	---	Worker - inhalative, long-term - local	9,91mg/m³	0,014
PROC8b	---	Worker - dermal, long-term - systemic	0,69mg/kg bw/day	0,011

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

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
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.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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: Uses in coatings		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC19: Hand-mixing with intimate contact and only PPE available	
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		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Daily amount per site	3 kg
	Fraction used at the main local source.	0,002
	Annually total	5000 tonnes
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	90 %
	Emission or Release Factor: Water	90 %
	Emission or Release Factor: Soil	0 %
	Indoor use.	
	Processing temperature: Ambient temperature	
	Processing pressure: Ambient temperature	
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	Air	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation
	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
	Water	Treat onsite wastewater (prior to receiving water

prevent/limit release from the site		discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 87 %)
	Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	87 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
	Disposal methods	Dispose of waste product or used containers according to local regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC19		
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, spray aerosol
	Vapour pressure	98 hPa
Amount used	n.a. in tier 1 TRA MODEL	
Frequency and duration of use	Frequency of use	< 300 days/year
	Frequency of use	> 4 days/week
	Exposure duration per day	> 240 min(PROC1, PROC2)
	Exposure duration per day	60 - 240 min(PROC10, PROC11, PROC13)
	Exposure duration per day	15 - 60 min(PROC8a, PROC8b, PROC19)
Human factors not influenced by risk management	Exposed skin areas	Hands and forearms. 1500 cm^2
Other operational conditions affecting workers exposure	Indoor use.	
	Outdoor use.(PROC1)	
Technical conditions and measures to control dispersion from source towards the worker	General exposures Continuous process	Clear spills immediately. Ensure operation is undertaken outdoors.(PROC1)
	General exposures Continuous process with sample collection	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Clear spills immediately.(PROC2)
	Bulk transfers	Ensure material transfers are under containment or

	Non-dedicated facility	extract ventilation. Provide extract ventilation to points where emissions occur. Use drum pumps or carefully pour from container. Locate bulk storage outdoors. Clear spills immediately.(PROC8a)
	Bulk transfers Dedicated facility	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Clear transfer lines prior to de-coupling. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Locate bulk storage outdoors. Clear spills immediately.(PROC8b)
	Roller, spreader, flow application cleaning Machine Manual	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Clear spills immediately.(PROC10)
	Treatment by dipping and pouring Machine Manual	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Clear spills immediately.(PROC13)
	Spraying/fogging by manual application with potential for aerosol generation	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Ensure that a spraying booth is used. Clear spills immediately.(PROC11)
	Transfer from/pouring from containers Mixing operations (closed systems) Manual without local exhaust ventilation Indoor.	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Clear spills immediately.(PROC19)
Conditions and measures related to personal protection, hygiene and health evaluation	If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A filter or better.	
	Wear suitable gloves (tested to EN374) and eye protection. Butyl rubber gloves offer good protection	

3. Exposure estimation and reference to its source

Environment

ERC8a, ERC8d: EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	---	Fresh water	PEC	0,139mg/L	0,535
ERC8a, ERC8d	---	Marine water	PEC	0,014mg/L	0,535
ERC8a, ERC8d	---	Fresh water sediment	PEC	0,186mg/kg	0,664
ERC8a, ERC8d	---	Marine sediment	PEC	0,019mg/kg	0,066
ERC8a, ERC8d	---	Soil	PEC	0,0002mg/kg	< 0,001
ERC8a, ERC8d	---	Sewage treatment plant (STP)	PEC	1,369mg/L	0,002
ERC8a, ERC8d	---	Total daily intake via local environment	PEC	0,003mg/kg bw/day	< 0,001

Workers

PROC1, PROC2, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC19: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0,154mg/m³	< 0,001
PROC1	---	Worker - dermal, long-term - systemic	0,342mg/kg bw/day	0,0054
PROC2	---	Worker - inhalative, long-term - local	22,03mg/m³	0,03
PROC2	---	Worker - dermal, long-term - systemic	0,137mg/kg bw/day	0,0022
PROC8a	---	Worker - inhalative, long-term - local	44,05mg/m³	0,06
PROC8a	---	Worker - dermal, long-term - systemic	0,137mg/kg bw/day	0,0022
PROC8b	---	Worker - inhalative, long-term - local	11,01mg/m³	0,015
PROC8b	---	Worker - dermal, long-term - systemic	0,686mg/kg bw/day	0,011
PROC10	---	Worker - inhalative, long-term - local	132,15mg/m³	0,18
PROC10	---	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,022
PROC11	---	Worker - inhalative, long-term - local	264,3mg/m³	0,36
PROC11	---	Worker - dermal, long-term - systemic	2,14mg/kg bw/day	0,034
PROC13	---	Worker - inhalative, long-term - local	66,08mg/m³	0,091
PROC13	---	Worker - dermal, long-	0,69mg/kg bw/day	0,011

		term - systemic		
PROC19	---	Worker - inhalative, long-term - local	220,25mg/m³	0,30
PROC19	---	Worker - dermal, long-term - systemic	28,28mg/kg bw/day	0,45

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

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
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.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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 in agrochemicals		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8c, ERC8d, ERC8f		
Amount used	Daily amount per site	2,7 kg
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	0,9
	Emission or Release Factor: Water	0,01
	Emission or Release Factor: Soil	0,09
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	Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to sewage treatment plant	Domestic sewage treatment is not assumed.	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13		
Product characteristics	Concentration of the	Covers percentage substance in the product up to

	Substance in Mixture/Article	25 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	98 hPa
Amount used	n.a. in tier 1 TRA MODEL	
Frequency and duration of use	Frequency of use	< 240 days/year
	Frequency of use	> 4 days/week
	Exposure duration per day	> 240 min
	Exposure duration per day	< 60 min(PROC8a, PROC13)
Technical conditions and measures to control dispersion from source towards the worker	Spraying/fogging by manual application Indoor. with local exhaust ventilation with potential for aerosol generation	Carry out in a vented booth or extracted enclosure. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20.(PROC11)
	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
Conditions and measures related to personal protection, hygiene and health evaluation	Spraying/fogging by manual application Indoor. with local exhaust ventilation with potential for aerosol generation	Wear suitable gloves tested to EN374. Wear suitable coveralls to prevent exposure to the skin.(PROC11)
	Spraying/fogging by manual application Outdoor. with potential for aerosol generation	Wear a respirator conforming to EN140 with Type A filter or better. Change filter cartridge on respirator daily. Wear suitable gloves tested to EN374. Wear suitable coveralls to prevent exposure to the skin.(PROC11)
	Wear suitable gloves tested to EN374.	

3. Exposure estimation and reference to its source

Environment

EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0,66µg/L	0,00254
---	---	Marine water	PEC	0,117µg/L	0,0045
---	---	Fresh water	PEC	3,97µg/kg dry	0,00318

		sediment		weight (d.w.)	
---	---	Marine sediment	PEC	0,703µg/kg dry weight (d.w.)	0,00562
---	---	Soil	PEC	0,247µg/kg dry weight (d.w.)	0,00103
---	---	Sewage treatment plant (STP)	PEC	0,165µg/L	< 0,0001

ESVOC spERC 8.11a.v1 has been used to evaluate the exposure for the environment.

Workers

PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	---	Inhalation worker exposure	12ppm	0,06
PROC2	---	Dermal worker exposure	0,822mg/kg/day	0,013
PROC4	---	Inhalation worker exposure	30ppm	0,15
PROC4	---	Dermal worker exposure	4,116mg/kg/day	0,065
PROC8a	---	Inhalation worker exposure	12ppm	0,06
PROC8a	---	Dermal worker exposure	8,226mg/kg/day	0,131
PROC8b	---	Inhalation worker exposure	30ppm	0,15
PROC8b	---	Dermal worker exposure	4,116mg/kg/day	0,065
PROC11	---	Inhalation worker exposure	30ppm	0,15
PROC11	---	Dermal worker exposure	12,857mg/kg/day	0,204
PROC13	---	Inhalation worker exposure	12ppm	0,06
PROC13	---	Dermal worker exposure	8,226mg/kg/day	0,131

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.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, 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: Uses in coatings		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC1: Adhesives, sealants PC9a: Coatings and paints, thinners, paint removers	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
Amount used	Daily amount per site	0,3 kg
	Fraction used at the main local source.	0,002
	Annually total	500 tonnes
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	90 %
	Emission or Release Factor: Water	90 %
	Emission or Release Factor: Soil	0 %
	Indoor use.	
	Processing temperature: Ambient temperature	
	Processing pressure: Ambient pressure.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	70 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Dispose of empty containers and wastes safely.
2.2 Contributing scenario controlling consumer exposure for: PC1: Glues, hobby use		
Activity	spray application	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 20 %.

	Physical Form (at time of use)	liquid
	Vapour pressure	98 hPa
Amount used	Amount used per event	150 g
Frequency and duration of use	Frequency of use	0 - 5 events/year
	Exposure duration per event	60 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 35 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.3 Contributing scenario controlling consumer exposure for: PC1: Glues DIY-use (carpet glue, tile glue, wood parquet glue)		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 20 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	98 hPa
Amount used	Amount used per event	150 g
Frequency and duration of use	Frequency of use	0 - 5 events/year
	Exposure duration per event	60 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 110 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.4 Contributing scenario controlling consumer exposure for: PC9a: Solvent rich, high solid, water borne paint		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 20 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	98 hPa
Amount used	Amount used per event	150 g
Frequency and duration of use	Frequency of use	0 - 5 events/year
	Exposure duration per event	60 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428 cm²
Other given operational conditions affecting consumers	Room size	20 m3

exposure		

2.5 Contributing scenario controlling consumer exposure for: PC9a: Aerosol spray can

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	98 hPa
Amount used	Amount used per event	150 g
Frequency and duration of use	Frequency of use	0 - 5 events/year
	Exposure duration per event	25 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

3. Exposure estimation and reference to its source

Environment

ERC8a: EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,0044mg/L	0,017
ERC8a	---	Marine water	PEC	0,0004mg/L	0,017
ERC8a	---	Fresh water sediment	PEC	0,0059mg/kg	0,021
ERC8a	---	Marine sediment	PEC	0,0005mg/kg	0,002
ERC8a	---	Soil	PEC	0,0001mg/kg	< 0,001
ERC8a	---	Sewage treatment plant (STP)	PEC	0,0161mg/L	< 0,001
ERC8a	---	Total daily intake via local environment	PEC	0,0001mg/kg bw/day	< 0,001

Consumers

PC1, PC9a: Solvent rich, high solid, water borne paint, PC9a: Aerosol spray can: ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC1	---	Consumer inhalation exposure	29,9mg/m³	0,245
PC1	---	Consumer dermal exposure	0,04mg/kg bw/day	0,00108
PC9a: Solvent	---	Consumer inhalation	0,03mg/m³	0,000246

rich, high solid, water borne paint		exposure		
PC9a: Solvent rich, high solid, water borne paint	---	Consumer dermal exposure	0,02mg/kg bw/day	0,000541
PC9a: Aerosol spray can	---	Consumer inhalation exposure	1,3mg/m³	0,0107
PC9a: Aerosol spray can	---	Consumer dermal exposure	0,02mg/kg bw/day	0,000541

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.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, see: http://www.ecetoc.org/tra
For further information on the assessment method, see:
http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp
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

1. Short title of Exposure Scenario 13: Uses in coatings		
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 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC15: Use as laboratory reagent PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation	
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		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 100%
Amount used	Regional use tonnage:	0,1
	Fraction used at the main local source.	0,05
	Annually total	60000 tonnes
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
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	98 %
	Emission or Release Factor: Water	2 %
	Emission or Release Factor: Soil	0 %
	Indoor use.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and	Air	Use containment measures to reduce fugitive emissions. (Efficiency: > 80 %)
	Air	Treatment of air emissions is not required for the

measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		purposes of REACH compliance but may be needed to comply with other environmental legislation, Use appropriate emission abatement equipment from LEV systems if required by local legislation., Use of technical measures such as catalytic or thermal oxidation to reduce emissions to air.
	Water	Onsite wastewater treatment required, If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., Do not release wastewater directly into environment.
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 88 %)
	Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	87 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Treat all waste as hazardous waste
	Disposal methods	Hazardous waste incineration., Dispose of waste or used sacks/containers according to local regulations. (Efficiency: 99,98 %)

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, 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.	
Technical conditions and measures to control dispersion from source towards the worker	General exposures	Handle substance within a closed system.(PROC1)
	Bulk transfers Non-dedicated facility	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Use drum pumps or carefully pour from container. Locate bulk storage outdoors.(PROC8a)
	Bulk transfers Dedicated facility	Ensure material transfers are under containment or extract ventilation.

		Provide extract ventilation to points where emissions occur. Clear transfer lines prior to de-coupling. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Locate bulk storage outdoors.(PROC8b)
	Film formation - force drying (50-100℃). Stoving (>100℃). UV/EB radiation curing	Use ventilation to extract vapours from freshly coated articles/objects.(PROC2)
	Film formation - air drying	Use ventilation to extract vapours from freshly coated articles/objects.(PROC4)
	Provide extract ventilation to points where emissions occur.(PROC5)	
	Carry out in a vented booth or extracted enclosure.(Automatic/robotic PROC7)	
	Carry out in a vented booth or extracted enclosure.(Manual PROC7)	
	Provide extract ventilation to material transfer points and other openings.(PROC8a)	
	Ensure material transfers are under containment or extract ventilation.(PROC8b)	
	Indoor.	Provide extract ventilation to points where emissions occur.(PROC10)
	Indoor.	Provide extract ventilation to points where emissions occur.(PROC13)
	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC14)	
Organisational measures to prevent /limit releases, dispersion and exposure	Bulk transfers Non-dedicated facility	If technical measures not practical: Avoid carrying out operation for more than 1 hour.(PROC8a)
	Bulk transfers Dedicated facility	If technical measures not practical: Avoid carrying out operation for more than 1 hour.(PROC8b)
Conditions and measures related to personal protection, hygiene and health evaluation	If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A filter or better. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Butyl rubber gloves offer good protection	
	Wear respiratory protection Wear face protection. Wear a full face respirator conforming to EN140 with Type A filter or better. Change filter cartridge on respirator daily.(Manual PROC7)	
	with local exhaust ventilation	(Efficiency: 90 %)(PROC2, PROC5, PROC8a, PROC9, PROC13, PROC14)
	with local exhaust ventilation	(Efficiency: 95 %)(PROC7)
	with local exhaust ventilation	(Efficiency: 97 %)(PROC8b)

3. Exposure estimation and reference to its source

Environment

ERC4: ECETOC TRA

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water sediment	PEC	0,718mg/kg dry weight (d.w.)	---
ERC4	---	Marine water	PEC	0,012mg/L	---
ERC4	---	Marine sediment	PEC	0,0719mg/kg dry weight (d.w.)	---
ERC4	180 days	Soil	PEC	0,0413mg/kg dry weight (d.w.)	---
ERC4	30 days	Soil	PEC	0,082mg/kg dry weight (d.w.)	---
ERC4	180 days	Grassland	PEC	0,0435mg/kg dry weight (d.w.)	---
ERC4	Annual average	Air	PEC	0,224mg/m³	---

Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	General exposures (closed systems)	Inhalation worker exposure	0,01ppm	< 0,001
PROC1	General exposures (closed systems)	Dermal worker exposure	0,03mg/kg bw/day	< 0,001
PROC2	General exposures (closed systems), Use in contained systems, with sample collection	Inhalation worker exposure	25ppm	0,125
PROC2	General exposures (closed systems), Use in contained systems, with sample collection	Consumer dermal exposure	1,3mg/kg bw/day	0,022
PROC2	Film formation - force drying (50-100°C). Stoving (>100°C). UV/EB radiation curing	Inhalation worker exposure	12,5ppm	0,063
PROC2	Film formation - force drying (50-100°C). Stoving (>100°C). UV/EB	Dermal worker exposure	1,3mg/kg bw/day	0,022

	radiation curing			
PROC3	Mixing operations (closed systems), General exposures	Inhalation worker exposure	50ppm	0,25
PROC3	Mixing operations (closed systems), General exposures	Dermal worker exposure	0,69mg/kg bw/day	0,011
PROC4	Film formation - air drying	Inhalation worker exposure	10ppm	0,05
PROC4	Film formation - air drying	Dermal worker exposure	6,8mg/kg bw/day	0,109
PROC5	Preparation of material for application, Mixing operations (open systems)	Inhalation worker exposure	25ppm	0,125
PROC5	Preparation of material for application, Mixing operations (open systems)	Dermal worker exposure	14mg/kg bw/day	0,218
PROC7	Spraying (automatic/robotic)	Inhalation worker exposure	25ppm	0,125
PROC7	Spraying (automatic/robotic)	Dermal worker exposure	43mg/kg bw/day	0,68
PROC7	Spraying	Inhalation worker exposure	25ppm	0,125
PROC7	Spraying	Dermal worker exposure	43mg/kg bw/day	0,68
PROC8a	Non-dedicated facility	Dermal worker exposure	14mg/kg bw/day	0,218
PROC8a	Non-dedicated facility	Inhalation worker exposure	25ppm	0,125
PROC8b	material transfers, Dedicated facility	Dermal worker exposure	14mg/kg bw/day	0,218
PROC8b	material transfers, Dedicated facility	Inhalation worker exposure	4,5ppm	0,023
PROC10	Roller, spreader, flow application	Dermal worker exposure	27mg/kg bw/day	0,435
PROC10	Roller, spreader, flow application	Inhalation worker exposure	25ppm	0,125
PROC13	Dipping, immersion and pouring	Dermal worker exposure	14mg/kg bw/day	0,218
PROC13	Dipping, immersion and pouring	Inhalation worker exposure	25ppm	0,125
PROC15	Laboratory activities	Dermal worker exposure	0,34mg/kg bw/day	0,005
PROC15	Laboratory activities	Inhalation worker exposure	50ppm	0,25
PROC9	material transfers, Drum/batch transfers, Transfer from/pouring from containers	Inhalation worker exposure	20ppm	0,1

PROC9	material transfers, Drum/batch transfers, Transfer from/pouring from containers	Dermal worker exposure	6,8mg/kg bw/day	0,109
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation	Dermal worker exposure	3,4mg/kg bw/day	0,054
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation	Inhalation worker exposure	25ppm	0,125

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

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Risk Management Measures are based on qualitative risk characterisation.
Guidance is based on assumed operating conditions which may not be applicable to all sites. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For further information on the assessment method, see: http://www.ecetoc.org/tra