Incozol LV

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

1.1 Product identifier

Trade name	:	Incozol LV
UK REACH Registration Number	:	UK-01-0871416914-4-0001
Substance name	:	Bis[2-(2-isopropyl-1,3-oxazolidin-3-yl)ethyl] carbonate (MCS)
EC-No.	:	429-990-6

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

Product use	:	Intermediate

1.3 Details of the supplier of the safety data sheet

Company name of supplier	:	Incorez Limited Miller Street Preston Lancashire PR1 1EA
Telephone	:	+44(0)1772 201964
Telefax	:	+44(0)1772 255670
E-mail address of person responsible for the SDS	:	sds@incorez.com

1.4 Emergency telephone number

National Chemical Emergency Centre (NCEC)
24 Hour Emergency Telephone Number +44 870 190 6777

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Serious eye damage, Category 1	H318: Causes serious eye damage.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Long-term (chronic) aquatic hazard, Category 3	H412: Harmful to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms	:	
Signal word	:	Danger
Hazard statements	:	H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H412 Harmful to aquatic life with long lasting effects.
Precautionary statements	:	**Prevention:** P261 Avoid breathing mist or vapours. P273 Avoid release to the environment. P280 Wear protective gloves/ eye protection/ face protection. **Response:** P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor. P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention. P362 + P364 Take off contaminated clothing and wash it before reuse.

2.3 Other hazards

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

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

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

SECTION 3: Composition/information on ingredients

3.1 Substances

EC-No. : 429-990-6

Components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)	M-Factor, SCL, ATE
Bis[2-(2-isopropyl-1,3-oxazolidin-3-yl)ethyl] carbonate (MCS) Contains: 3-Oxazolidineethanol, 2-(1-methylethyl) >= 4<= 10 %	Not Assigned 429-990-6	100	

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.

If inhaled : Move to fresh air.
Consult a physician after significant exposure.

In case of skin contact : Take off contaminated clothing and shoes immediately.
Wash off with soap and plenty of water.
If symptoms persist, call a physician.

In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Keep eye wide open while rinsing.

If swallowed : Do not induce vomiting without medical advice.
Rinse mouth with water.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Allergic reactions
Excessive lachrymation
See Section 11 for more detailed information on health effects and symptoms.

Risks : irritant effects
sensitising effects

May cause an allergic skin reaction.
Causes serious eye damage.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : In case of fire, use water/water spray/water jet/carbon dioxide/sand/foam/alcohol resistant foam/chemical powder for extinction.

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products : No hazardous combustion products are known

5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

Further information : Standard procedure for chemical fires.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Deny access to unprotected persons.

6.2 Environmental precautions

Environmental precautions : Do not flush into surface water or sanitary sewer system.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid exceeding the given occupational exposure limits (see section 8).
Do not get in eyes, on skin, or on clothing.
For personal protection see section 8.
Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Smoking, eating and drinking should be prohibited in the application area.
Follow standard hygiene measures when handling chemical products

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in accordance with local regulations.

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

7.3 Specific end use(s)

Specific use(s) : Consult most current local Product Data Sheet prior to any use.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters *	Basis *

Contains no substances with occupational exposure limit values.

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

Substance name	End Use	Exposure routes	Potential health effects	Value
Bis[2-(2-isopropyl-1,3-oxazolidin-3-yl)ethyl]	Workers	Inhalation	Long-term systemic effects	2,5 mg/m3

carbonate (MCS)				
	Workers	Dermal	Long-term systemic effects	0,7 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0,43 mg/m3
	Consumers	Dermal	Long-term systemic effects	0,25 mg/kg bw/day
	Consumers	Oral	Long-term systemic effects	0,25 mg/kg bw/day

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

Substance name	Environmental Compartment	Value
Bis[2-(2-isopropyl-1,3-oxazolidin-3-yl)ethyl] carbonate (MCS)	Fresh water	0,086 mg/l
	Remarks:Derivation of the PNEC	
	Intermittent use/release	0,857 mg/l
	Remarks:Derivation of the PNEC	
	Soil	0,205 mg/kg dry weight (d.w.)
	Remarks:Derivation of the PNEC	
	Marine water	0,009 mg/l
	Remarks:Derivation of the PNEC	
	Sewage treatment plant	100 mg/l
	Remarks:Derivation of the PNEC	

8.2 Exposure controls

Engineering measures

Maintain air concentrations below occupational exposure standards.
Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Eye/face protection : Safety glasses with side-shields conforming to EN166
Eye wash bottle with pure water

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard must be worn at all times when handling chemical products. Reference number EN 374. Follow manufacturer specifications.

Suitable for short time use or protection against splashes:
Butyl rubber/nitrile rubber gloves (> 0,1 mm)
Contaminated gloves should be removed.
Suitable for permanent exposure:
Viton gloves (0.4 mm),
breakthrough time >30 min.

Skin and body protection : Protective clothing (e.g. Safety shoes acc. to EN ISO 20345, long-sleeved working clothing, long trousers). Rubber aprons and protective boots are additionaly recommended for mixing and stirring work.

Respiratory protection : No special measures required.

Environmental exposure controls

General advice : Do not flush into surface water or sanitary sewer system.

If the product contaminates rivers and lakes or drains inform respective authorities.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	colourless
Odour	:	sweet
Melting point/range	:	ca. -67 °C
Boiling point/boiling range	:	ca. 200 °C
Flammability (solid, gas)	:	No data available

Upper/lower flammability or explosive limits

Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Flash point	:	76 °C Method: closed cup
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
pH	:	Not applicable

Viscosity

Viscosity, kinematic	:	> 7 mm2/s (40 °C)

Solubility(ies)

Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	No data available
Vapour pressure	:	0,01 hPa
Density	:	ca. 1,07 g/cm3 (20 °C)
Relative vapour density	:	No data available
Particle characteristics	:	No data available

9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

The product is chemically stable.

10.3 Possibility of hazardous reactions

Hazardous reactions : No hazards to be specially mentioned.

10.4 Conditions to avoid

Conditions to avoid : No data available

10.5 Incompatible materials

Materials to avoid : No data available

10.6 Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

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

Acute toxicity

Not classified based on available information.

Skin corrosion/irritation

Not classified based on available information.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity
Not classified based on available information.

Reproductive toxicity
Not classified based on available information.

STOT - single exposure
Not classified based on available information.

STOT - repeated exposure
Not classified based on available information.

Aspiration toxicity
Not classified based on available information.

11.2 Information on other hazards

Endocrine disrupting properties

Product:

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

SECTION 12: Ecological information

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment

Product:

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

12.6 Endocrine disrupting properties

Product:

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

12.7 Other adverse effects

Product:

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

14.1 UN number or ID number

ADR	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.2 UN proper shipping name

ADR	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.3 Transport hazard class(es)

ADR	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.4 Packing group

ADR	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA (Cargo)	:	Not regulated as a dangerous good
IATA (Passenger)	:	Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Not applicable

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

Relevant EU provisions transposed through retained EU law

UK REACH List of restrictions (Annex 17)	:	Not applicable
UK REACH Candidate list of substances of very high concern (SVHC) for Authorisation	:	Not applicable
The Persistent Organic Pollutants Regulations (retained Regulation (EU) 2019/1021 as amended for Great Britain)	:	Not applicable
International Chemical Weapons Convention (CWC) Schedules of Toxic Chemicals and Precursors	:	Not applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable
UK REACH List of substances subject to authorisation (Annex XIV)	:	Not applicable
GB Export and import of hazardous chemicals - Prior Informed Consent (PIC) Regulation	:	Not applicable
Control of Major Accident Hazards Regulations 2015 (COMAH)		Not applicable

Volatile organic compounds	:	Law on the incentive tax for volatile organic compounds (VOCV) no VOC duties Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control) Not applicable

If other regulatory information applies that is not already provided elsewhere in the Safety Data Sheet, then it is described in this subsection.

Health, safety and environmental regulation/legislation specific for the substance or mixture:	:	Environmental Protection Act 1990 & Subsidiary Regulations Health and Safety at Work Act 1974 & Subsidiary Regulations Control of Substances Hazardous to Health Regulations (COSHH) May be subject to the Control of Major Accident Hazards Regulations (COMAH), and amendments.

15.2 Chemical safety assessment

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

SECTION 16: Other information

Full text of other abbreviations

ADR	:	European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS	:	Chemical Abstracts Service
DNEL	:	Derived no-effect level
EC50	:	Half maximal effective concentration
GHS	:	Globally Harmonized System
IATA	:	International Air Transport Association
IMDG	:	International Maritime Code for Dangerous Goods
LD50	:	Median lethal dosis (the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals)
LC50	:	Median lethal concentration (concentrations of the chemical in air that kills 50% of the test animals during the observation period)
MARPOL	:	International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978
OEL	:	Occupational Exposure Limit
PBT	:	Persistent, bioaccumulative and toxic
PNEC	:	Predicted no effect concentration
REACH	:	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency
SVHC	:	Substances of Very High Concern

vPvB : Very persistent and very bioaccumulative

Further information

The information contained in this Safety Data Sheet corresponds to our level of knowledge at the time of publication. All warranties are excluded. Our most current General Sales Conditions shall apply. Please consult the product data sheet prior to any use and processing.

Changes as compared to previous version !

GB / EN

Annex to the extended safety data sheet (eSDS)

1. Overview of exposure scenarios (ES)

ES number	ES Code	Scenario name	Use descriptor	Page
1	1	Industrial manufacture of the substance	ERC 1; PROC 1, 2, 3, 4, 8B, 9	14
2	2	Formulation of sealants and adhesives	ERC 2; PROC 2, 3, 4, 5, 8A, 8B, 9	24
3	3	Formulation of coatings and fillers	ERC 2; PROC 2, 3, 4, 5, 8A, 8B, 9	36
4	4	Formulation of polymer preparations	ERC 3; PROC 2, 3, 4, 5, 8A, 8B, 9	47
5	5	Industrial application of sealants and adhesives	ERC 5; PROC 5, 7, 8B, 10, 14	59
6	6	Industrial application of coatings and fillers	ERC 5; PROC 5, 7, 8B, 10, 13	68
7	7	Professional application of sealants and adhesives (indoor)	ERC 8C; PROC 5, 8A, 10, 11, 14	78
8	8	Professional application of sealants and adhesives (out-door)	ERC 8F; PROC 5, 8A, 10, 11, 14	87
9	9	Professional application of coatings and fillers (indoor)	ERC 8C; PROC 5, 8A, 10, 11, 13	96
10	10	Professional application of coatings and fillers (outdoor)	ERC 8F; PROC 5, 8A, 10, 11, 13	105
11	11	Consumer use of sealants and adhesives (indoor)	ERC 8C; PC 1	114
12	12	Consumer use of sealants and adhesives (outdoor)	ERC 8F; PC 1	120
13	13	Consumer use of coatings and fillers (indoor)	ERC 8C; PC 9a, 9b	126
14	14	Consumer use of coatings and fillers (outdoor)	ERC 8F; PC 9a, 9b	130

1.1 General information

Human health - Worker

Acute/short term exposure

Peak exposure is considered to be not relevant for the identified use scenarios. Thus, the occupational conditions (OC) and risk management measures (RMM) which have been implemented to control long term exposure are also sufficient to control acute/short term exposure. Consequently, a quantitative assessment of acute/short term exposure and the subsequent risk assessment are not needed and have not been included in the exposure scenarios.

Long term exposure

A quantitative risk assessment has been performed in chapter 9 and 10 for those exposure scenarios for which a DNEL has been derived, i.e. systemic effects after long term inhalation and dermal exposure.
As DNELs for local dermal sensitising effects could not be established on the basis of the existing data, the risk arising from these effects can only be assessed qualitatively. Due to its skin sensitizing and eye damaging properties the substance has been assigned to the “high hazard category”. The PROC-specific OCs and RMMs, which are listed in the chapter 9 tables describing the exposure scenarios, have been selected in line with the recommendations given in the ECHA Guidance on IR&CSR, Part E for this category. They are found to provide adequate control. If the manufacturer/user complies with these conditions and measurements the likelihood of effects due to the skin sensitization and eye damaging potential of the substance is avoided.

Human health - Consumer

The substance is used in consumer articles. Therefore, a qualitative exposure/risk assessment for the general population is conducted. Selected default scenarios from the ConsExpo fact sheet “Do-it-yourself products” were used as a worst-case scenario for inhalation and dermal exposure.

2.1 Scenario 1: Industrial manufacture of the substance (1)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 1

Free short title	Industrial manufacture of the substance (1)
Systematic title based on use descriptor	ERC 1; PROC 1, 2, 3, 4, 8B, 9
Name of constributing environmental scenario and corresponding ERC	ERC 1 Production of chemicals

Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line)

2.2 Conditions of use affecting exposure

2.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 1

Operational conditions	
Annual site tonnage	99 to/year
Daily amount used at site	4,950 kg/day
Release times per year	20 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	5 %
Release fraction to wastewater from process	0 %
Release fraction to soil from process	0.010 %
Fraction tonnage to region	100 %
Fraction used at main source	100 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day
Other modified EUSES values	
Fraction released to waste water (Femis.water)	0 % *(justification: All waste solvents will be sent to disposal companies. Water of reaction is distilled off and it is unlikely that this will contain appreciable amounts of the substance or its degradation products. Local STP will get unintentional spillages or washings only.)*

2.2.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 1

Name of contributing scenario	PROC 1 Use in closed process, no likelihood of exposure

Qualitative Risk Assessment	
General	Keep good industrial hygiene. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Recording of any 'near miss' situations Regular cleaning of work area Ensure procedures and training for emergency decontamination and disposal are in place. Permit to work for maintenance work
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no

2.2.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 2

Name of contributing scenario	PROC 2 Use in closed, continuous process with occasional controlled exposure
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection. Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no

2.2.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 3

Name of contributing scenario	PROC 3 Use in closed batch process (synthesis or formulation)
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

2.2.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 4

Name of contributing scenario	PROC 4 Use in batch and other process (synthesis) where opportunity for exposure arises
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

2.2.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 8B

Name of contributing scenario	PROC 8b Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

2.2.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 9

Name of contributing scenario	PROC 9 Transfer of chemicals into small containers (dedicated filling line)
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

2.3 Exposure estimation

2.3.1 Contributing Scenario (1) controlling environmental exposure for ERC1
Industrial manufacture of the substance

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk Assessment Spreadsheet Model 1.24a.

2.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000017 mg/L	0.0216 mg/L	0.000806	6.14E6
Freshwater sediment	0.00022 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.000806	6.14E6
Marine water	1.84E-6 mg/L	0.00216 mg/L	0.000853	5.80E6
Marine water sediment	0.000023 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.000853	5.81E6

2.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.007492 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.144625	2.19E4

2.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0 mg/L	100 mg/L	0	∞

2.3.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 1
Industrial manufacture of the substance

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.001714 mg/kg_{bw}/day	1.25 mg/kg_{bw}/day	0.001371
inhalation, longterm systemic	0.143519 mg/m^3	4.4 mg/m^3	0.032618
Combined routes	0.022217 mg/kg_{bw}/day	-	0.033989

2.3.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 2
Industrial manufacture of the substance

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.054857
inhalation, longterm systemic	1.435 mg/m³	4.4 mg/m³	0.32618
Combined routes	0.273599 mg/kg$_{bw}$/day	-	0.381037

2.3.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 3
Industrial manufacture of the substance

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.034286 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.027429
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.170 mg/m³	4.4 mg/m³	0.038636
Combined routes	0.058571 mg/kg$_{bw}$/day	-	0.066065

2.3.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 4
Industrial manufacture of the substance

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.342857 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.274286
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.170 mg/m³	4.4 mg/m³	0.038636

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
Combined routes	0.367143 mg/kg$_{bw}$/day	-	0.312922

2.3.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 8B
Industrial manufacture of the substance

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.685714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.548571
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.400 mg/m³	4.4 mg/m³	0.090909
Combined routes	0.742857 mg/kg$_{bw}$/day	-	0.639481

2.3.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 9
Industrial manufacture of the substance

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.342857 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.274286
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.400 mg/m³	4.4 mg/m³	0.090909
Combined routes	0.400 mg/kg$_{bw}$/day	-	0.365195

3.1 Scenario 2: Formulation of sealants and adhesives (2)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 2

Free short title	Formulation of sealants and adhesives (2)
Systematic title based on use descriptor	ERC 2; PROC 2, 3, 4, 5, 8A, 8B, 9
Name of constributing environmental scenario and corresponding ERC	ERC 2 Formulation of preparations
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line)

3.2 Conditions of use affecting exposure

3.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 2

Operational conditions	
Annual site tonnage	99 to/year
Daily amount used at site	450 kg/day
Release times per year	220 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	3.6 %
Release fraction to wastewater from process	0 %
Release fraction to soil from process	0 %
Fraction tonnage to region	100 %
Fraction used at main source	100 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day

Risk management measures	
SpERC	UserDefined_FEICA SPERC 2.1c.v2 (User-defined SpERC in accordance with the correspondent SpERC Fact Sheet (Reference: Date February 2013) provided by the association FEICA. For RMM specifications please refer to the correspondent SpERC factsheet.)

3.2.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 2

Name of contributing scenario	PROC 2 Use in closed, continuous process with occasional controlled exposure
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no

3.2.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 3

Name of contributing scenario	PROC 3 Use in closed batch process (synthesis or formulation)
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

3.2.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 4

Name of contributing scenario	PROC 4 Use in batch and other process (synthesis) where opportunity for exposure arises
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

3.2.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 5

Name of contributing scenario	PROC 5 Mixing or blending in batch processes (multistage and/or significant contact)
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

3.2.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 8A

Name of contributing scenario	PROC 8a Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

3.2.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 8B

Name of contributing scenario	PROC 8b Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

3.2.8 Contributing Scenario (8) controlling industrial worker exposure for PROC 9

Name of contributing scenario	PROC 9 Transfer of chemicals into small containers (dedicated filling line)
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

3.3 Exposure estimation

3.3.1 Contributing Scenario (1) controlling environmental exposure for ERC2
Formulation of sealants and adhesives

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk Assessment Spreadsheet Model 1.24a.

3.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000017 mg/L	0.0216 mg/L	0.000806	5.58E5
Freshwater sediment	0.00022 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.000806	5.58E5
Marine water	1.84E-6 mg/L	0.00216 mg/L	0.000853	5.28E5
Marine water sediment	0.000023 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.000853	5.28E5

3.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.00545 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.105204	2,740.84

3.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0 mg/L	100 mg/L	0	∞

3.3.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 2
Formulation of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg_{bw}/day	1.25 mg/kg_{bw}/day	0.054857
inhalation, longterm systemic	1.435 mg/m^3	4.4 mg/m^3	0.32618
Combined routes	0.273599 mg/kg_{bw}/day	-	0.381037

3.3.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 3
Formulation of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.034286 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.027429
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.170 mg/m³	4.4 mg/m³	0.038636
Combined routes	0.058571 mg/kg$_{bw}$/day	-	0.066065

3.3.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 4
Formulation of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.342857 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.274286
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.170 mg/m³	4.4 mg/m³	0.038636
Combined routes	0.367143 mg/kg$_{bw}$/day	-	0.312922

3.3.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 5
Formulation of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.685714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.548571
inhalation, longterm systemic (measured /	1.7 mg/m³	4.4 mg/m³	0.386364

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
external: Inhalation exposure was calculated using ART version 1.5.)			
Combined routes	0.928571 mg/kg$_{bw}$/day	-	0.934935

3.3.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 8A
Formulation of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.685714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.548571
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	1.2 mg/m³	4.4 mg/m³	0.272727
Combined routes	0.857143 mg/kg$_{bw}$/day	-	0.821299

3.3.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 8B
Formulation of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.685714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.548571
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.400 mg/m³	4.4 mg/m³	0.090909
Combined routes	0.742857 mg/kg$_{bw}$/day	-	0.639481

3.3.8 Contributing Scenario (8) controlling industrial worker exposure for PROC 9

Formulation of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.342857 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.274286
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.400 mg/m³	4.4 mg/m³	0.090909
Combined routes	0.400 mg/kg$_{bw}$/day	-	0.365195

4.1 Scenario 3: Formulation of coatings and fillers (3)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 3

Free short title	Formulation of coatings and fillers (3)
Systematic title based on use descriptor	ERC 2; PROC 2, 3, 4, 5, 8A, 8B, 9
Name of constributing environmental scenario and corresponding ERC	ERC 2 Formulation of preparations
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line)

4.2 Conditions of use affecting exposure

4.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 2

Operational conditions	
Annual site tonnage	99 to/year
Daily amount used at site	440 kg/day
Release times per year	225 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	0.600 %
Release fraction to wastewater from process	0 %
Release fraction to soil from process	0 %
Fraction tonnage to region	100 %
Fraction used at main source	100 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day
Risk management measures	
SpERC	CEPE SPERC 2.1b1.v1 - CEPE - Formulation of Organic Solvent Borne Coatings and Inks - Small Scale (<100 tpa solvent use) – VOC (SpERC in accordance with the correspondent SpERC Fact Sheet (Reference: AJN/ajns0319b, Date: 16 October 2010) provided by the association CEPE. For RMM specifications please refer to the correspondent SpERC factsheet.)

4.2.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 2

Name of contributing scenario	PROC 2 Use in closed, continuous process with occasional controlled exposure
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	

Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no

4.2.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 3

Name of contributing scenario	PROC 3 Use in closed batch process (synthesis or formulation)
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)

Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

4.2.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 4

Name of contributing scenario	PROC 4 Use in batch and other process (synthesis) where opportunity for exposure arises
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2

Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

4.2.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 5

Name of contributing scenario	PROC 5 Mixing or blending in batch processes (multistage and/or significant contact)
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial

Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

4.2.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 8A

Name of contributing scenario	PROC 8a Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	

Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

4.2.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 8B

Name of contributing scenario	PROC 8b Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

4.2.8 Contributing Scenario (8) controlling industrial worker exposure for PROC 9

Name of contributing scenario	PROC 9 Transfer of chemicals into small containers (dedicated filling line)
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

4.3 Exposure estimation

4.3.1 Contributing Scenario (1) controlling environmental exposure for ERC2

Formulation of coatings and fillers

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk Assessment Spreadsheet Model 1.24a.

4.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000017 mg/L	0.0216 mg/L	0.000806	5.46E5
Freshwater sediment	0.00022 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.000806	5.46E5
Marine water	1.84E-6 mg/L	0.00216 mg/L	0.000853	5.16E5
Marine water sediment	0.000023 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.000853	5.16E5

4.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.001074 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.020732	1.44E4

4.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0 mg/L	100 mg/L	0	∞

4.3.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 2
Formulation of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg_{bw}/day	1.25 mg/kg_{bw}/day	0.054857
inhalation, longterm systemic	1.435 mg/m^3	4.4 mg/m^3	0.32618

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
Combined routes	0.273599 mg/kg$_{bw}$/day	-	0.381037

4.3.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 3
Formulation of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.034286 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.027429
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.170 mg/m³	4.4 mg/m³	0.038636
Combined routes	0.058571 mg/kg$_{bw}$/day	-	0.066065

4.3.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 4
Formulation of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.342857 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.274286
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.170 mg/m³	4.4 mg/m³	0.038636
Combined routes	0.367143 mg/kg$_{bw}$/day	-	0.312922

4.3.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 5
Formulation of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.685714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.548571
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	1.7 mg/m³	4.4 mg/m³	0.386364
Combined routes	0.928571 mg/kg$_{bw}$/day	-	0.934935

4.3.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 8A
Formulation of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.685714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.548571
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	1.2 mg/m³	4.4 mg/m³	0.272727
Combined routes	0.857143 mg/kg$_{bw}$/day	-	0.821299

4.3.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 8B
Formulation of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.685714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.548571
inhalation, longterm systemic (measured / external: Inhalation exposure was calculat-	0.400 mg/m³	4.4 mg/m³	0.090909

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
ed using ART version 1.5.)			
Combined routes	0.742857 mg/kg$_{bw}$/day	-	0.639481

4.3.8 Contributing Scenario (8) controlling industrial worker exposure for PROC 9
Formulation of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.342857 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.274286
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.400 mg/m³	4.4 mg/m³	0.090909
Combined routes	0.400 mg/kg$_{bw}$/day	-	0.365195

5.1 Scenario 4: Formulation of polymer preparations (4)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 4

Free short title	Formulation of polymer preparations (4)
Systematic title based on use descriptor	ERC 3; PROC 2, 3, 4, 5, 8A, 8B, 9
Name of constributing environmental scenario and corresponding ERC	ERC 3 Formulation in articles

Name(s) of contributing worker scenarios and corresponding PROCs	PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line)

5.2 Conditions of use affecting exposure

5.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 3

Operational conditions	
Annual site tonnage	99 to/year
Daily amount used at site	450 kg/day
Release times per year	220 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	3.6 %
Release fraction to wastewater from process	0 %
Release fraction to soil from process	0 %
Fraction tonnage to region	100 %
Fraction used at main source	100 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day
Risk management measures	

SpERC	UserDefined_CEPE SPERC 2.1b.v1_analogue (User-defined SpERC with release fractions in analogy to the formulation SpERC provided by CEPE (CEPE SPERC 2.1b.v1 (Reference: AJN/ajns0319b, Date: 16 October 2010)) and FEICA (FEICA SPERC 2.1c.v2 (Reference:Reference Date February 2013)). For details on these SpERCs and the appropriate risk management measures (RMMs) please refer to the corresponding SpERC factsheets published by the associations CEPE and FEICA.)

5.2.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 2

Name of contributing scenario	PROC 2 Use in closed, continuous process with occasional controlled exposure
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %

Respiratory protection	no

5.2.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 3

Name of contributing scenario	PROC 3 Use in closed batch process (synthesis or formulation)
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

5.2.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 4

Name of contributing scenario	PROC 4 Use in batch and other process (synthesis) where opportunity for exposure arises

Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

5.2.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 5

Name of contributing scenario	PROC 5 Mixing or blending in batch processes (multistage and/or significant contact)
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

5.2.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 8A

Name of contributing scenario	PROC 8a Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

5.2.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 8B

Name of contributing scenario	PROC 8b Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was calculated using ART version 1.5.

5.2.8 Contributing Scenario (8) controlling industrial worker exposure for PROC 9

Name of contributing scenario	PROC 9 Transfer of chemicals into small containers (dedicated filling line)
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

5.3 Exposure estimation

5.3.1 Contributing Scenario (1) controlling environmental exposure for ERC3
Formulation of polymer preparations

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk Assessment Spreadsheet Model 1.24a.

5.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000017 mg/L	0.0216 mg/L	0.000806	5.58E5
Freshwater sediment	0.00022 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.000806	5.58E5
Marine water	1.84E-6 mg/L	0.00216 mg/L	0.000853	5.28E5
Marine water sediment	0.000023 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.000853	5.28E5

5.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.00545 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.105204	2,740.84

5.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0 mg/L	100 mg/L	0	∞

5.3.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 2
Formulation of polymer preparations

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg_{bw}/day	1.25 mg/kg_{bw}/day	0.054857
inhalation, longterm systemic	1.435 mg/m^3	4.4 mg/m^3	0.32618
Combined routes	0.273599 mg/kg_{bw}/day	-	0.381037

5.3.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 3
Formulation of polymer preparations

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.034286 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.027429
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.170 mg/m³	4.4 mg/m³	0.038636
Combined routes	0.058571 mg/kg$_{bw}$/day	-	0.066065

5.3.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 4
Formulation of polymer preparations

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.342857 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.274286
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.170 mg/m³	4.4 mg/m³	0.038636
Combined routes	0.367143 mg/kg$_{bw}$/day	-	0.312922

5.3.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 5
Formulation of polymer preparations

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.685714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.548571
inhalation, longterm systemic (measured /	1.7 mg/m³	4.4 mg/m³	0.386364

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
external: Inhalation exposure was calculated using ART version 1.5.)			
Combined routes	0.928571 mg/kg$_{bw}$/day	-	0.934935

5.3.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 8A
Formulation of polymer preparations

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.685714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.548571
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	1.2 mg/m³	4.4 mg/m³	0.272727
Combined routes	0.857143 mg/kg$_{bw}$/day	-	0.821299

5.3.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 8B
Formulation of polymer preparations

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.685714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.548571
inhalation, longterm systemic (measured / external: Inhalation exposure was calculated using ART version 1.5.)	0.400 mg/m³	4.4 mg/m³	0.090909
Combined routes	0.742857 mg/kg$_{bw}$/day	-	0.639481

5.3.8 Contributing Scenario (8) controlling industrial worker exposure for PROC 9

Formulation of polymer preparations

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.342857 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.274286
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.400 mg/m³	4.4 mg/m³	0.090909
Combined routes	0.400 mg/kg$_{bw}$/day	-	0.365195

6.1 Scenario 5: Industrial application of sealants and adhesives (5)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 5

Free short title	Industrial application of sealants and adhesives (5)
Systematic title based on use descriptor	ERC 5; PROC 5, 7, 8B, 10, 14
Name of constributing environmental scenario and corresponding ERC	ERC 5 Industrial use resulting in inclusion into or onto a matrix
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 7 - Industrial spraying PROC 7 - Industrial spraying PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 10 - Roller application or brushing PROC 14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation

6.2 Conditions of use affecting exposure

6.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 5

Operational conditions	
Annual site tonnage	99 to/year

Daily amount used at site	450 kg/day
Release times per year	220 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	1.7 %
Release fraction to wastewater from process	0 %
Release fraction to soil from process	0 %
Fraction tonnage to region	100 %
Fraction used at main source	100 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day
Risk management measures	
SpERC	FEICA SPERC 5.1b.v1 - FEICA - Industrial Use of Substances other than Solvents in Transportation (Automotive/aircraft/rail vehicles) / industrial Building Construction Adhesives

6.2.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 5

Name of contributing scenario	PROC 5 Mixing or blending in batch processes (multistage and/or significant contact)
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)

Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

6.2.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 7

Name of contributing scenario	PROC 7 Industrial spraying
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	

Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 95 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

6.2.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 7

Name of contributing scenario	PROC 7 Industrial spraying
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no

Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	95 %

6.2.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 8B

Name of contributing scenario	PROC 8b Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

6.2.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 10

Name of contributing scenario	PROC 10 Roller application or brushing
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

6.2.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 14

Name of contributing scenario	PROC 14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

6.3 Exposure estimation

6.3.1 Contributing Scenario (1) controlling environmental exposure for ERC5
Industrial application of sealants and adhesives

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk As-

sessment Spreadsheet Model 1.24a.

6.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000017 mg/L	0.0216 mg/L	0.000806	5.58E5
Freshwater sediment	0.00022 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.000806	5.58E5
Marine water	1.84E-6 mg/L	0.00216 mg/L	0.000853	5.28E5
Marine water sediment	0.000023 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.000853	5.28E5

6.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.002678 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.051705	5,656.371

6.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0 mg/L	100 mg/L	0	∞

6.3.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 5
Industrial application of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg_{bw}/day	1.25 mg/kg_{bw}/day	0.054857
inhalation, longterm systemic	3.588 mg/m^3	4.4 mg/m^3	0.81545
Combined routes	0.58114 mg/kg_{bw}/day	-	0.870308

6.3.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 7

Industrial application of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.214286 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.171429
inhalation, longterm systemic	2.153 mg/m³	4.4 mg/m³	0.48927
Combined routes	0.521827 mg/kg$_{bw}$/day	-	0.660699

6.3.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 7
Industrial application of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.214286 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.171429
inhalation, longterm systemic	2.153 mg/m³	4.4 mg/m³	0.48927
Combined routes	0.521827 mg/kg$_{bw}$/day	-	0.660699

6.3.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 8B
Industrial application of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.068571 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.054857
inhalation, longterm systemic	3.588 mg/m³	4.4 mg/m³	0.81545
Combined routes	0.58114 mg/kg$_{bw}$/day	-	0.870308

6.3.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 10
Industrial application of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.137143 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.109714
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.067 mg/m³	4.4 mg/m³	0.015227
Combined routes	0.146714 mg/kg$_{bw}$/day	-	0.124942

6.3.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 14
Industrial application of sealants and adhesives

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.017143 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.013714
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.0002 mg/m³	4.4 mg/m³	0.000045
Combined routes	0.017171 mg/kg$_{bw}$/day	-	0.01376

7.1 Scenario 6: Industrial application of coatings and fillers (6)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 6

Free short title	Industrial application of coatings and fillers (6)
Systematic title based on use descriptor	ERC 5; PROC 5, 7, 8B, 10, 13

Name of constributing environmental scenario and corresponding ERC	ERC 5 Industrial use resulting in inclusion into or onto a matrix
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 7 - Industrial spraying PROC 7 - Industrial spraying PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 10 - Roller application or brushing PROC 13 - Treatment of articles by dipping and pouring

7.2 Conditions of use affecting exposure

7.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 5

Operational conditions	
Annual site tonnage	99 to/year
Daily amount used at site	440 kg/day
Release times per year	225 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	2 %
Release fraction to wastewater from process	0 %
Release fraction to soil from process	0 %
Fraction tonnage to region	100 %
Fraction used at main source	100 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day
Risk management measures	
SpERC	CEPE SPERC 5.1a.v1 - CEPE - application - industrial - spraying - indoor use – solids (SpERC in accordance with the correspondent SpERC Fact Sheet (Reference: AJN/ajns0326b, Date: 12 September 2010) provided by the association CEPE. For RMM specifications please refer to the correspondent SpERC factsheet.)

7.2.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 5

Name of contributing scenario	PROC 5 Mixing or blending in batch processes (multistage and/or significant contact)
Qualitative Risk Assessment	
General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

7.2.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 7

Name of contributing scenario	PROC 7 Industrial spraying
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 95 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

7.2.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 7

Name of contributing scenario	PROC 7 Industrial spraying
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	95 %

7.2.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 8B

Name of contributing scenario	PROC 8b Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

7.2.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 10

Name of contributing scenario	PROC 10 Roller application or brushing
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

7.2.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 13

Name of contributing scenario	PROC 13 Treatment of articles by dipping and pouring
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

7.3 Exposure estimation

7.3.1 Contributing Scenario (1) controlling environmental exposure for ERC5
Industrial application of coatings and fillers

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk As-

sessment Spreadsheet Model 1.24a.

7.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000017 mg/L	0.0216 mg/L	0.000806	5.46E5
Freshwater sediment	0.00022 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.000806	5.46E5
Marine water	1.84E-6 mg/L	0.00216 mg/L	0.000853	5.16E5
Marine water sediment	0.000023 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.000853	5.16E5

7.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.003116 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.060152	4,735.335

7.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0 mg/L	100 mg/L	0	∞

7.3.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 5
Industrial application of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg_{bw}/day	1.25 mg/kg_{bw}/day	0.054857
inhalation, longterm systemic	3.588 mg/m^3	4.4 mg/m^3	0.81545
Combined routes	0.58114 mg/kg_{bw}/day	-	0.870308

7.3.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 7

Industrial application of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.214286 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.171429
inhalation, longterm systemic	2.153 mg/m³	4.4 mg/m³	0.48927
Combined routes	0.521827 mg/kg$_{bw}$/day	-	0.660699

7.3.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 7
Industrial application of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.214286 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.171429
inhalation, longterm systemic	2.153 mg/m³	4.4 mg/m³	0.48927
Combined routes	0.521827 mg/kg$_{bw}$/day	-	0.660699

7.3.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 8B
Industrial application of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.068571 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.054857
inhalation, longterm systemic	3.588 mg/m³	4.4 mg/m³	0.81545
Combined routes	0.58114 mg/kg$_{bw}$/day	-	0.870308

7.3.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 10
Industrial application of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.137143 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.109714
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.067 mg/m³	4.4 mg/m³	0.015227
Combined routes	0.146714 mg/kg$_{bw}$/day	-	0.124942

7.3.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 13
Industrial application of coatings and fillers

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.068571 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.00067 mg/m³	4.4 mg/m³	0.000152
Combined routes	0.068667 mg/kg$_{bw}$/day	-	0.055009

8.1 Scenario 7: Professional application of sealants and adhesives (indoor) (7)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 7

Free short title	Professional application of sealants and adhesives (indoor) (7)
Systematic title based on use descriptor	ERC 8C; PROC 5, 8A, 10, 11, 14

Name of constributing environmental scenario and corresponding ERC	ERC 8c Wide dispersive indoor use resulting in inclusion into or onto a matrix
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 10 - Roller application or brushing PROC 11 - Non industrial spraying PROC 14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation

8.2 Conditions of use affecting exposure

8.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 8C

Operational conditions	
ANNUAL_TONNAGE	99 to/year
Daily amount used at site	0.054247 kg/day
Release times per year	365 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	15 %
Release fraction to wastewater from process	1 %
Release fraction to soil from process	0 %
Fraction tonnage to region	10 %
Fraction used at main source	0.200 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day

8.2.2 Contributing Scenario (2) controlling professional worker exposure for PROC 5

Name of contributing scenario	PROC 5 Mixing or blending in batch processes (multistage and/or significant contact)
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

8.2.3 Contributing Scenario (3) controlling professional worker exposure for PROC 8A

Name of contributing scenario	PROC 8a Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

8.2.4 Contributing Scenario (4) controlling professional worker exposure for PROC 10

Name of contributing scenario	PROC 10 Roller application or brushing
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

8.2.5 Contributing Scenario (5) controlling professional worker exposure for PROC 11

Name of contributing scenario	PROC 11 Non industrial spraying
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	95 %

8.2.6 Contributing Scenario (6) controlling professional worker exposure for PROC 14

Name of contributing scenario	PROC 14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

8.3 Exposure estimation

8.3.1 Contributing Scenario (1) controlling environmental exposure for ERC8C
Professional application of sealants and adhesives (indoor)

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk As-

sessment Spreadsheet Model 1.24a.

8.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000033 mg/L	0.0216 mg/L	0.001542	35.181
Freshwater sediment	0.000421 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.001541	35.191
Marine water	3.43E-6 mg/L	0.00216 mg/L	0.001589	34.143
Marine water sediment	0.000043 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.001588	34.152

8.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.000215 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.004143	13.842

8.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0.000159 mg/L	100 mg/L	1.59E-6	3.41E4

8.3.2 Contributing Scenario (2) controlling professional worker exposure for PROC 5
Professional application of sealants and adhesives (indoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg_{bw}/day	1.25 mg/kg_{bw}/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.087 mg/m^3	4.4 mg/m^3	0.019773
Combined routes	0.081 mg/kg_{bw}/day	-	0.07463

8.3.3 Contributing Scenario (3) controlling professional worker exposure for PROC 8A
Professional application of sealants and adhesives (indoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.068571 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.200 mg/m³	4.4 mg/m³	0.045455
Combined routes	0.097143 mg/kg$_{bw}$/day	-	0.100312

8.3.4 Contributing Scenario (4) controlling professional worker exposure for PROC 10
Professional application of sealants and adhesives (indoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.137143 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.109714
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.068 mg/m³	4.4 mg/m³	0.015455
Combined routes	0.146857 mg/kg$_{bw}$/day	-	0.125169

8.3.5 Contributing Scenario (5) controlling professional worker exposure for PROC 11
Professional application of sealants and adhesives (indoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.535714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.428571
inhalation, longterm systemic	2.153 mg/m³	4.4 mg/m³	0.48927
Combined routes	0.843256 mg/kg$_{bw}$/day	-	0.917842

8.3.6 Contributing Scenario (6) controlling professional worker exposure for PROC 14
Professional application of sealants and adhesives (indoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.017143 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.013714
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.0002 mg/m³	4.4 mg/m³	0.000045
Combined routes	0.017171 mg/kg$_{bw}$/day	-	0.01376

9.1 Scenario 8: Professional application of sealants and adhesives (outdoor) (8)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 8

Free short title	Professional application of sealants and adhesives (outdoor) (8)
Systematic title based on use descriptor	ERC 8F; PROC 5, 8A, 10, 11, 14
Name of constributing environmental scenario and corresponding ERC	ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Name(s) of contributing worker scenarios and corresponding PROCs	PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 10 - Roller application or brushing PROC 11 - Non industrial spraying PROC 14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation

9.2 Conditions of use affecting exposure

9.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 8F

Operational conditions	
ANNUAL_TONNAGE	99 to/year
Daily amount used at site	0.054247 kg/day
Release times per year	365 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	15 %
Release fraction to wastewater from process	1 %
Release fraction to soil from process	0.500 %
Fraction tonnage to region	10 %
Fraction used at main source	0.200 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day

9.2.2 Contributing Scenario (2) controlling professional worker exposure for PROC 5

Name of contributing scenario	PROC 5 Mixing or blending in batch processes (multistage and/or significant contact)
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

9.2.3 Contributing Scenario (3) controlling professional worker exposure for PROC 8A

Name of contributing scenario	PROC 8a Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

9.2.4 Contributing Scenario (4) controlling professional worker exposure for PROC 10

Name of contributing scenario	PROC 10 Roller application or brushing
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

9.2.5 Contributing Scenario (5) controlling professional worker exposure for PROC 11

Name of contributing scenario	PROC 11 Non industrial spraying
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	95 %

9.2.6 Contributing Scenario (6) controlling professional worker exposure for PROC 14

Name of contributing scenario	PROC 14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

9.3 Exposure estimation

9.3.1 Contributing Scenario (1) controlling environmental exposure for ERC8F
Professional application of sealants and adhesives (outdoor)

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk As-

sessment Spreadsheet Model 1.24a.

9.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000033 mg/L	0.0216 mg/L	0.001542	35.181
Freshwater sediment	0.000421 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.001541	35.191
Marine water	3.43E-6 mg/L	0.00216 mg/L	0.001589	34.143
Marine water sediment	0.000043 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.001588	34.152

9.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.000215 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.004143	13.842

9.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0.000159 mg/L	100 mg/L	1.59E-6	3.41E4

9.3.2 Contributing Scenario (2) controlling professional worker exposure for PROC 5
Professional application of sealants and adhesives (outdoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg_{bw}/day	1.25 mg/kg_{bw}/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.0083 mg/m^3	4.4 mg/m^3	0.001886
Combined routes	0.069757 mg/kg_{bw}/day	-	0.056744

9.3.3 Contributing Scenario (3) controlling professional worker exposure for PROC 8A
Professional application of sealants and adhesives (outdoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.068571 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.350 mg/m³	4.4 mg/m³	0.079545
Combined routes	0.118571 mg/kg$_{bw}$/day	-	0.134403

9.3.4 Contributing Scenario (4) controlling professional worker exposure for PROC 10
Professional application of sealants and adhesives (outdoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.137143 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.109714
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.120 mg/m³	4.4 mg/m³	0.027273
Combined routes	0.154286 mg/kg$_{bw}$/day	-	0.136987

9.3.5 Contributing Scenario (5) controlling professional worker exposure for PROC 11
Professional application of sealants and adhesives (outdoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.535714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.428571
inhalation, longterm systemic	1.507 mg/m³	4.4 mg/m³	0.342489
Combined routes	0.750993 mg/kg$_{bw}$/day	-	0.771061

9.3.6 Contributing Scenario (6) controlling professional worker exposure for PROC 14
Professional application of sealants and adhesives (outdoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.017143 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.013714
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.00025 mg/m³	4.4 mg/m³	0.000057
Combined routes	0.017179 mg/kg$_{bw}$/day	-	0.013771

10.1 Scenario 9: Professional application of coatings and fillers (indoor) (9)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 9

Free short title	Professional application of coatings and fillers (indoor) (9)
Systematic title based on use descriptor	ERC 8C; PROC 5, 8A, 10, 11, 13
Name of constributing environmental scenario and corresponding ERC	ERC 8c Wide dispersive indoor use resulting in inclusion into or onto a matrix

Name(s) of contributing worker scenarios and corresponding PROCs	PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 10 - Roller application or brushing PROC 11 - Non industrial spraying PROC 13 - Treatment of articles by dipping and pouring

10.2 Conditions of use affecting exposure

10.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 8C

Operational conditions	
ANNUAL_TONNAGE	99 to/year
Daily amount used at site	0.054247 kg/day
Release times per year	365 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	15 %
Release fraction to wastewater from process	1 %
Release fraction to soil from process	0 %
Fraction tonnage to region	10 %
Fraction used at main source	0.200 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day

10.2.2 Contributing Scenario (2) controlling professional worker exposure for PROC 5

Name of contributing scenario	PROC 5 Mixing or blending in batch processes (multistage and/or significant contact)
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

10.2.3 Contributing Scenario (3) controlling professional worker exposure for PROC 8A

Name of contributing scenario	PROC 8a Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

10.2.4 Contributing Scenario (4) controlling professional worker exposure for PROC 10

Name of contributing scenario	PROC 10 Roller application or brushing
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

10.2.5 Contributing Scenario (5) controlling professional worker exposure for PROC 11

Name of contributing scenario	PROC 11 Non industrial spraying
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	95 %

10.2.6 Contributing Scenario (6) controlling professional worker exposure for PROC 13

Name of contributing scenario	PROC 13 Treatment of articles by dipping and pouring
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

10.3 Exposure estimation

10.3.1 Contributing Scenario (1) controlling environmental exposure for ERC8C
Professional application of coatings and fillers (indoor)

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk As-

sessment Spreadsheet Model 1.24a.

10.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000033 mg/L	0.0216 mg/L	0.001542	35.181
Freshwater sediment	0.000421 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.001541	35.191
Marine water	3.43E-6 mg/L	0.00216 mg/L	0.001589	34.143
Marine water sediment	0.000043 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.001588	34.152

10.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.000215 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.004143	13.842

10.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0.000159 mg/L	100 mg/L	1.59E-6	3.41E4

10.3.2 Contributing Scenario (2) controlling professional worker exposure for PROC 5
Professional application of coatings and fillers (indoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg_{bw}/day	1.25 mg/kg_{bw}/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.087 mg/m^3	4.4 mg/m^3	0.019773
Combined routes	0.081 mg/kg_{bw}/day	-	0.07463

10.3.3 Contributing Scenario (3) controlling professional worker exposure for PROC 8A
Professional application of coatings and fillers (indoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.068571 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.200 mg/m³	4.4 mg/m³	0.045455
Combined routes	0.097143 mg/kg$_{bw}$/day	-	0.100312

10.3.4 Contributing Scenario (4) controlling professional worker exposure for PROC 10
Professional application of coatings and fillers (indoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.137143 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.109714
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.068 mg/m³	4.4 mg/m³	0.015455
Combined routes	0.146857 mg/kg$_{bw}$/day	-	0.125169

10.3.5 Contributing Scenario (5) controlling professional worker exposure for PROC 11
Professional application of coatings and fillers (indoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.535714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.428571
inhalation, longterm systemic	2.153 mg/m³	4.4 mg/m³	0.48927
Combined routes	0.843256 mg/kg$_{bw}$/day	-	0.917842

10.3.6 Contributing Scenario (6) controlling professional worker exposure for PROC 13
Professional application of coatings and fillers (indoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.00067 mg/m³	4.4 mg/m³	0.000152
Combined routes	0.068667 mg/kg$_{bw}$/day	-	0.055009

11.1 Scenario 10: Professional application of coatings and fillers (outdoor) (10)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 10

Free short title	Professional application of coatings and fillers (outdoor) (10)
Systematic title based on use descriptor	ERC 8F; PROC 5, 8A, 10, 11, 13
Name of constributing environmental scenario and corresponding ERC	ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Name(s) of contributing worker scenarios and corresponding PROCs	PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 10 - Roller application or brushing PROC 11 - Non industrial spraying PROC 13 - Treatment of articles by dipping and pouring

11.2 Conditions of use affecting exposure

11.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 8F

Operational conditions	
ANNUAL_TONNAGE	99 to/year
Daily amount used at site	0.054247 kg/day
Release times per year	365 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	15 %
Release fraction to wastewater from process	1 %
Release fraction to soil from process	0.500 %
Fraction tonnage to region	10 %
Fraction used at main source	0.200 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day

11.2.2 Contributing Scenario (2) controlling professional worker exposure for PROC 5

Name of contributing scenario	PROC 5 Mixing or blending in batch processes (multistage and/or significant contact)
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

11.2.3 Contributing Scenario (3) controlling professional worker exposure for PROC 8A

Name of contributing scenario	PROC 8a Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

11.2.4 Contributing Scenario (4) controlling professional worker exposure for PROC 10

Name of contributing scenario	PROC 10 Roller application or brushing
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

11.2.5 Contributing Scenario (5) controlling professional worker exposure for PROC 11

Name of contributing scenario	PROC 11 Non industrial spraying
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	95 %

11.2.6 Contributing Scenario (6) controlling professional worker exposure for PROC 13

Name of contributing scenario	PROC 13 Treatment of articles by dipping and pouring
Qualitative Risk Assessment	

General	Keep good industrial hygiene. Ensure procedures and training for emergency decontamination and disposal are in place. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Avoid contact with contaminated tools and objects. Wear suitable working clothes. Permit to work for maintenance work Recording of any 'near miss' situations Regular cleaning of work area
Eyes	Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	5 %, concentration has been considered linearly *(justification: Limit the substance in product to (%): 5)*
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	> 4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value inhalation	Inhalation exposure was estimated using ART version 1.5.

11.3 Exposure estimation

11.3.1 Contributing Scenario (1) controlling environmental exposure for ERC8F
Professional application of coatings and fillers (outdoor)

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk As-

sessment Spreadsheet Model 1.24a.

11.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000033 mg/L	0.0216 mg/L	0.001542	35.181
Freshwater sediment	0.000421 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.001541	35.191
Marine water	3.43E-6 mg/L	0.00216 mg/L	0.001589	34.143
Marine water sediment	0.000043 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.001588	34.152

11.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.000215 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.004143	13.842

11.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0.000159 mg/L	100 mg/L	1.59E-6	3.41E4

11.3.2 Contributing Scenario (2) controlling professional worker exposure for PROC 5
Professional application of coatings and fillers (outdoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg_{bw}/day	1.25 mg/kg_{bw}/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.0083 mg/m^3	4.4 mg/m^3	0.001886
Combined routes	0.069757 mg/kg_{bw}/day	-	0.056744

11.3.3 Contributing Scenario (3) controlling professional worker exposure for PROC 8A
Professional application of coatings and fillers (outdoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.068571 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.350 mg/m³	4.4 mg/m³	0.079545
Combined routes	0.118571 mg/kg$_{bw}$/day	-	0.134403

11.3.4 Contributing Scenario (4) controlling professional worker exposure for PROC 10
Professional application of coatings and fillers (outdoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal, longterm systemic	0.137143 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.109714
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.120 mg/m³	4.4 mg/m³	0.027273
Combined routes	0.154286 mg/kg$_{bw}$/day	-	0.136987

11.3.5 Contributing Scenario (5) controlling professional worker exposure for PROC 11
Professional application of coatings and fillers (outdoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.535714 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.428571
inhalation, longterm systemic	1.507 mg/m³	4.4 mg/m³	0.342489
Combined routes	0.750993 mg/kg$_{bw}$/day	-	0.771061

11.3.6 Contributing Scenario (6) controlling professional worker exposure for PROC 13
Professional application of coatings and fillers (outdoor)

The quantitative risk characterisation for this worker exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the dermal and inhalatory route together with the total exposure of workers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal, longterm systemic	0.068571 mg/kg$_{bw}$/day	1.25 mg/kg$_{bw}$/day	0.054857
inhalation, longterm systemic (measured / external: Inhalation exposure was estimated using ART version 1.5.)	0.0012 mg/m³	4.4 mg/m³	0.000273
Combined routes	0.068743 mg/kg$_{bw}$/day	-	0.05513

12.1 Scenario 11: Consumer use of sealants and adhesives (indoor) (11)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 11

Free short title	Consumer use of sealants and adhesives (indoor) (11)
Systematic title based on use descriptor	ERC 8C; PC 1
Name of constributing environmental scenario and corresponding ERC	ERC 8c Wide dispersive indoor use resulting in inclusion into or onto a matrix
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 1 Adhesives, Sealants PC 1 Adhesives, Sealants PC 1 Adhesives, Sealants

12.2 Conditions of use affecting exposure

12.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 8C

Operational conditions	
ANNUAL_TONNAGE	99 to/year
Daily amount used at site	0.054247 kg/day
Release times per year	365 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	15 %
Release fraction to wastewater from process	1 %
Release fraction to soil from process	0 %
Fraction tonnage to region	10 %
Fraction used at main source	0.200 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day

12.2.2 Contributing Scenario (2) controlling consumer exposure for PC 1

Name of contributing scenario	PC 1 Adhesives, Sealants
Scenario subtitle	Mixing loading
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration yearly
Frequency of use	1 per year
Exposure time	480 min
Application duration	480 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per year
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	

Inhalation	1.00E4 g
Dermal	2 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	215 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	1 m^3
Ventilation rate	0.600 1/h
Release are is constant	
Release area	1,000 cm^2
Release temperature	20 °C
Dermal	
Uptake fraction	100 %

12.2.3 Contributing Scenario (3) controlling consumer exposure for PC 1

Name of contributing scenario	PC 1 Adhesives, Sealants
Scenario subtitle	Joint and assembly sealant
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration yearly
Frequency of use	1 per year
Exposure time	480 min
Application duration	480 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per year
Release duration	2.88E4 sec
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	

Inhalation	1.00E4 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	2 cm^2
Contact rate	50 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	20 m^3
Ventilation rate	0.600 1/h
Release area increases over time	
Release area	1.5 cm^2
Release temperature	20 °C
Dermal	
Uptake fraction	100 %

12.2.4 Contributing Scenario (4) controlling consumer exposure for PC 1

Name of contributing scenario	PC 1 Adhesives, Sealants
Scenario subtitle	Glue to surface
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration yearly
Frequency of use	1 per year
Exposure time	480 min
Application duration	480 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per year
Release duration	2.88E4 sec
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	

Inhalation	1.00E4 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	430 cm^2
Contact rate	30 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3
Ventilation rate	0.600 1/h
Release area increases over time	
Release area	1.00E4 cm^2
Release temperature	20 °C
Dermal	
Uptake fraction	100 %

12.3 Exposure estimation

12.3.1 Contributing Scenario (1) controlling environmental exposure for ERC8C
Consumer use of sealants and adhesives (indoor)

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk Assessment Spreadsheet Model 1.24a.

12.3.1.1 Aquatic compartment (including sediment)

Compartments	**PEC**	**PNEC**	**RCR = PEC/PNEC**	**MSafe kg/d**
Freshwater	0.000033 mg/L	0.0216 mg/L	0.001542	35.181
Freshwater sediment	0.000421 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.001541	35.191
Marine water	3.43E-6 mg/L	0.00216 mg/L	0.001589	34.143
Marine water sediment	0.000043 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.001588	34.152

12.3.1.2 Terrestrial compartment

Compartments	**PEC**	**PNEC**	**RCR = PEC/PNEC**	**MSafe kg/d**
Agricultural soil	0.000215 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.004143	13.842

12.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0.000159 mg/L	100 mg/L	1.59E-6	3.41E4

12.3.2 Contributing Scenario (2) controlling consumer exposure for PC 1
Consumer use of sealants and adhesives (indoor) Mixing loading

The quantitative risk characterisation for this consumer exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the oral, dermal and inhalatory route together with the total exposure of consumers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal longterm systemic	0.009132 mg/kg$_{bw}$/day	0.630 mg/kg$_{bw}$/day	0.014496
inhalation longterm systemic (Mean concentration yearly)	0.011517 mg/m^3	0.940 mg/m^3	0.012252
oral	-	-	-
Combined routes	0.011237 mg/kg$_{bw}$/day	-	0.026748

12.3.3 Contributing Scenario (3) controlling consumer exposure for PC 1
Consumer use of sealants and adhesives (indoor) Joint and assembly sealant

The quantitative risk characterisation for this consumer exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the oral, dermal and inhalatory route together with the total exposure of consumers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal longterm systemic	0.109589 mg/kg$_{bw}$/day	0.630 mg/kg$_{bw}$/day	0.173951
inhalation longterm systemic (Mean concentration yearly)	0.003404 mg/m^3	0.940 mg/m^3	0.003622
oral	-	-	-
Combined routes	0.110211 mg/kg$_{bw}$/day	-	0.177573

12.3.4 Contributing Scenario (4) controlling consumer exposure for PC 1
Consumer use of sealants and adhesives (indoor) Glue to surface

The quantitative risk characterisation for this consumer exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the oral, dermal and inhalatory route together with the total exposure of consumers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal longterm systemic	0.065753 mg/kg$_{bw}$/day	0.630 mg/kg$_{bw}$/day	0.104371
inhalation longterm systemic (Mean concentration yearly)	0.010671 mg/m^3	0.940 mg/m^3	0.011352
oral	-	-	-
Combined routes	0.067704 mg/kg$_{bw}$/day	-	0.115723

13.1 Scenario 12: Consumer use of sealants and adhesives (outdoor) (12)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 12

Free short title	Consumer use of sealants and adhesives (outdoor) (12)
Systematic title based on use descriptor	ERC 8F; PC 1
Name of constributing environmental scenario and corresponding ERC	ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 1 Adhesives, Sealants PC 1 Adhesives, Sealants PC 1 Adhesives, Sealants

13.2 Conditions of use affecting exposure

13.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 8F

Operational conditions	
ANNUAL_TONNAGE	99 to/year
Daily amount used at site	0.054247 kg/day
Release times per year	365 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100

Release fraction to air from process	15 %
Release fraction to wastewater from process	1 %
Release fraction to soil from process	0.500 %
Fraction tonnage to region	10 %
Fraction used at main source	0.200 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day

13.2.2 Contributing Scenario (2) controlling consumer exposure for PC 1

Name of contributing scenario	PC 1 Adhesives, Sealants
Scenario subtitle	Mixing loading
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration yearly
Frequency of use	1 per year
Exposure time	480 min
Application duration	480 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per year
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1.00E4 g
Dermal	2 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	215 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	

Room volume	1 m^3
Ventilation rate	1.5 1/h
Release are is constant	
Release area	1,000 cm^2
Release temperature	20 °C
Dermal	
Uptake fraction	100 %

13.2.3 Contributing Scenario (3) controlling consumer exposure for PC 1

Name of contributing scenario	PC 1 Adhesives, Sealants
Scenario subtitle	Joint and assembly sealant
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration yearly
Frequency of use	1 per year
Exposure time	480 min
Application duration	480 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per year
Release duration	2.88E4 sec
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1.00E4 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	2 cm^2
Contact rate	50 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	

Room volume	20 m^3
Ventilation rate	1.5 1/h
Release area increases over time	
Release area	1.5 cm^2
Release temperature	20 °C
Dermal	
Uptake fraction	100 %

13.2.4 Contributing Scenario (4) controlling consumer exposure for PC 1

Name of contributing scenario	PC 1 Adhesives, Sealants
Scenario subtitle	Glue to surface
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration yearly
Frequency of use	1 per year
Exposure time	480 min
Application duration	480 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per year
Release duration	2.88E4 sec
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1.00E4 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	430 cm^2
Contact rate	30 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	

Room volume	58 m^3
Ventilation rate	1.5 1/h
Release area increases over time	
Release area	1.00E4 cm^2
Release temperature	20 °C
Dermal	
Uptake fraction	100 %

13.3 Exposure estimation

13.3.1 Contributing Scenario (1) controlling environmental exposure for ERC8F
Consumer use of sealants and adhesives (outdoor)

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk Assessment Spreadsheet Model 1.24a.

13.3.1.1 Aquatic compartment (including sediment)

Compartments	**PEC**	**PNEC**	**RCR = PEC/PNEC**	**MSafe kg/d**
Freshwater	0.000033 mg/L	0.0216 mg/L	0.001542	35.181
Freshwater sediment	0.000421 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.001541	35.191
Marine water	3.43E-6 mg/L	0.00216 mg/L	0.001589	34.143
Marine water sediment	0.000043 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.001588	34.152

13.3.1.2 Terrestrial compartment

Compartments	**PEC**	**PNEC**	**RCR = PEC/PNEC**	**MSafe kg/d**
Agricultural soil	0.000215 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.004143	13.842

13.3.1.3 Microbiological activity in sewage treatment systems

Compartments	**PEC**	**PNEC**	**RCR = PEC/PNEC**	**MSafe kg/d**
STP	0.000159 mg/L	100 mg/L	1.59E-6	3.41E4

13.3.2 Contributing Scenario (2) controlling consumer exposure for PC 1
Consumer use of sealants and adhesives (outdoor) Mixing loading

The quantitative risk characterisation for this consumer exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the oral, dermal and inhalatory route together with the total exposure of consumers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal longterm systemic	0.009132 mg/kg$_{bw}$/day	0.630 mg/kg$_{bw}$/day	0.014496
inhalation longterm systemic (Mean concentration yearly)	0.01108 mg/m^3	0.940 mg/m³	0.011788
oral	-	-	-
Combined routes	0.011158 mg/kg$_{bw}$/day	-	0.026283

13.3.3 Contributing Scenario (3) controlling consumer exposure for PC 1
Consumer use of sealants and adhesives (outdoor) Joint and assembly sealant

The quantitative risk characterisation for this consumer exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the oral, dermal and inhalatory route together with the total exposure of consumers over all routes.

Route	**Exposure concentration (EC)**	**DNEL**	**Risk characterisation ratio = EC/DNEL**
dermal longterm systemic	0.109589 mg/kg$_{bw}$/day	0.630 mg/kg$_{bw}$/day	0.173951
inhalation longterm systemic (Mean concentration yearly)	0.00209 mg/m^3	0.940 mg/m³	0.002224
oral	-	-	-
Combined routes	0.109971 mg/kg$_{bw}$/day	-	0.176175

13.3.4 Contributing Scenario (4) controlling consumer exposure for PC 1
Consumer use of sealants and adhesives (outdoor) Glue to surface

The quantitative risk characterisation for this consumer exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the oral, dermal and inhalatory route together with the total exposure of consumers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal longterm systemic	0.065753 mg/kg$_{bw}$/day	0.630 mg/kg$_{bw}$/day	0.104371
inhalation longterm systemic (Mean concentration yearly)	0.010651 mg/m^3	0.940 mg/m^3	0.01133
oral	-	-	-
Combined routes	0.0677 mg/kg$_{bw}$/day	-	0.115701

14.1 Scenario 13: Consumer use of coatings and fillers (indoor) (13)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 13

Free short title	Consumer use of coatings and fillers (indoor) (13)
Systematic title based on use descriptor	ERC 8C; PC 9a, 9b
Name of constributing environmental scenario and corresponding ERC	ERC 8c Wide dispersive indoor use resulting in inclusion into or onto a matrix
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 9a Coatings and Paints, thinners, paint removers PC 9b Filler, putties

14.2 Conditions of use affecting exposure

14.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 8C

Operational conditions	
ANNUAL_TONNAGE	99 to/year
Daily amount used at site	0.054247 kg/day
Release times per year	365 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	15 %
Release fraction to wastewater from process	1 %
Release fraction to soil from process	0 %
Fraction tonnage to region	10 %
Fraction used at main source	0.200 %
STP	yes
River flow rate	18000 m^3/day

Municipal sewage treatment plant discharge	2000000 L/day

14.2.2 Contributing Scenario (2) controlling consumer exposure for PC 9a

Name of contributing scenario	PC 9a Coatings and paints, thinners, paint removers
Scenario subtitle	General coatings
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration yearly
Frequency of use	1 per year
Exposure time	480 min
Application duration	480 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per year
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1.00E4 g
Dermal	0.250 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	108 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	0.600 1/h
Release area increases over time	
Release area	1.50E5 cm^2
Release temperature	15 °C
Dermal	
Uptake fraction	100 %

14.2.3 Contributing Scenario (3) controlling consumer exposure for PC 9b

Name of contributing scenario	PC 9b Fillers, putties, plasters, modelling clay
Scenario subtitle	Fillers, putties
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration yearly
Frequency of use	3 per year
Exposure time	480 min
Application duration	480 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	3 per year
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1.00E4 g
Dermal	0.050 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	22 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	20 m^3
Ventilation rate	0.600 1/h
Release area increases over time	
Release area	200 cm^2
Release temperature	20 °C
Dermal	
Uptake fraction	100 %

14.3 Exposure estimation

14.3.1 Contributing Scenario (1) controlling environmental exposure for ERC8C
Consumer use of coatings and fillers (indoor)

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk Assessment Spreadsheet Model 1.24a.

14.3.1.1 Aquatic compartment (including sediment)

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Freshwater	0.000033 mg/L	0.0216 mg/L	0.001542	35.181
Freshwater sediment	0.000421 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.001541	35.191
Marine water	3.43E-6 mg/L	0.00216 mg/L	0.001589	34.143
Marine water sediment	0.000043 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.001588	34.152

14.3.1.2 Terrestrial compartment

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
Agricultural soil	0.000215 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.004143	13.842

14.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0.000159 mg/L	100 mg/L	1.59E-6	3.41E4

14.3.2 Contributing Scenario (2) controlling consumer exposure for PC 9a
Consumer use of coatings and fillers (indoor) General coatings

The quantitative risk characterisation for this consumer exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the oral, dermal and inhalatory route together with the total exposure of consumers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal longterm systemic	0.001142 mg/kg$_{bw}$/day	0.630 mg/kg$_{bw}$/day	0.001812
inhalation longterm systemic (Mean concentration yearly)	0.010958 mg/m^3	0.940 mg/m³	0.011657
oral	-	-	-
Combined routes	0.003144 mg/kg$_{bw}$/day	-	0.013469

14.3.3 Contributing Scenario (3) controlling consumer exposure for PC 9b
Consumer use of coatings and fillers (indoor) Fillers, putties

The quantitative risk characterisation for this consumer exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the oral, dermal and inhalatory route together with the total exposure of consumers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal longterm systemic	0.000685 mg/kg$_{bw}$/day	0.630 mg/kg$_{bw}$/day	0.001087
inhalation longterm systemic (Mean concentration yearly)	0.030585 mg/m^3	0.940 mg/m³	0.032537
oral	-	-	-
Combined routes	0.006275 mg/kg$_{bw}$/day	-	0.033624

15.1 Scenario 14: Consumer use of coatings and fillers (outdoor) (14)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

Description of ES 14

Free short title	Consumer use of coatings and fillers (outdoor) (14)
Systematic title based on use descriptor	ERC 8F; PC 9a, 9b
Name of constributing environmental scenario and corresponding ERC	ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 9a Coatings and Paints, thinners, paint removers PC 9b Filler, putties

15.2 Conditions of use affecting exposure

15.2.1 Contributing Scenario (1) controlling environmental exposure for ERC 8F

Operational conditions	
ANNUAL_TONNAGE	99 to/year
Daily amount used at site	0.054247 kg/day
Release times per year	365 days/year
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	15 %
Release fraction to wastewater from process	1 %
Release fraction to soil from process	0.500 %
Fraction tonnage to region	10 %
Fraction used at main source	0.200 %
STP	yes
River flow rate	18000 m^3/day
Municipal sewage treatment plant discharge	2000000 L/day

15.2.2 Contributing Scenario (2) controlling consumer exposure for PC 9a

Name of contributing scenario	PC 9a Coatings and paints, thinners, paint removers
Scenario subtitle	General coatings
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration yearly
Frequency of use	1 per year
Exposure time	480 min
Application duration	480 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per year
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	

Inhalation	1.00E4 g
Dermal	0.250 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	108 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Release are is constant	
Release area	1.50E5 cm^2
Release temperature	20 °C
Dermal	
Uptake fraction	100 %

15.2.3 Contributing Scenario (3) controlling consumer exposure for PC 9b

Name of contributing scenario	PC 9b Fillers, putties, plasters, modelling clay
Scenario subtitle	Fillers, putties
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration yearly
Frequency of use	3 per year
Exposure time	480 min
Application duration	480 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	3 per year
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1.00E4 g

Dermal	0.050 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	22 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	20 m^3
Ventilation rate	1.5 1/h
Release area increases over time	
Release area	200 cm^2
Release temperature	20 °C
Dermal	
Uptake fraction	100 %

15.3 Exposure estimation

15.3.1 Contributing Scenario (1) controlling environmental exposure for ERC8F
Consumer use of coatings and fillers (outdoor)

The quantitative risk characterisation for this environmental exposure has been calculated using EasyTRA.

The environmental exposure calculation per compartment is based on the algorithms of the EU TGD 2003 Risk Assessment Spreadsheet Model 1.24a.

15.3.1.1 Aquatic compartment (including sediment)

Compartments	**PEC**	**PNEC**	**RCR = PEC/PNEC**	**MSafe kg/d**
Freshwater	0.000033 mg/L	0.0216 mg/L	0.001542	35.181
Freshwater sediment	0.000421 mg/kg_{dwt}	0.273 mg/kg_{dwt}	0.001541	35.191
Marine water	3.43E-6 mg/L	0.00216 mg/L	0.001589	34.143
Marine water sediment	0.000043 mg/kg_{dwt}	0.0273 mg/kg_{dwt}	0.001588	34.152

15.3.1.2 Terrestrial compartment

Compartments	**PEC**	**PNEC**	**RCR = PEC/PNEC**	**MSafe kg/d**
Agricultural soil	0.000215 mg/kg_{dwt}	0.0518 mg/kg_{dwt}	0.004143	13.842

15.3.1.3 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	RCR = PEC/PNEC	MSafe kg/d
STP	0.000159 mg/L	100 mg/L	1.59E-6	3.41E4

15.3.2 Contributing Scenario (2) controlling consumer exposure for PC 9a
Consumer use of coatings and fillers (outdoor) General coatings

The quantitative risk characterisation for this consumer exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the oral, dermal and inhalatory route together with the total exposure of consumers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal longterm systemic	0.001142 mg/kg$_{bw}$/day	0.630 mg/kg$_{bw}$/day	0.001812
inhalation longterm systemic (Mean concentration yearly)	0.011096 mg/m^3	0.940 mg/m^3	0.011805
oral	-	-	-
Combined routes	0.00317 mg/kg$_{bw}$/day	-	0.013617

15.3.3 Contributing Scenario (3) controlling consumer exposure for PC 9b
Consumer use of coatings and fillers (outdoor) Fillers, putties

The quantitative risk characterisation for this consumer exposure has been calculated by EasyTRA.

The following table shows the exposure estimations via the oral, dermal and inhalatory route together with the total exposure of consumers over all routes.

Route	Exposure concentration (EC)	DNEL	Risk characterisation ratio = EC/DNEL
dermal longterm systemic	0.000685 mg/kg$_{bw}$/day	0.630 mg/kg$_{bw}$/day	0.001087
inhalation longterm systemic (Mean concentration yearly)	0.029913 mg/m^3	0.940 mg/m^3	0.031823
oral	-	-	-
Combined routes	0.006152 mg/kg$_{bw}$/day	-	0.03291

Annex I ART Report

Conditions for all uses described in tables below:

Exposure time	480 min
Product type	liquid
Activity coefficient	1 (default)
Housekeeping in place	yes

Article I. Industrial Uses

Process category (PROC)	**3**	**4**	**5**	**8a**	**8b**
Process temperature	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)
Vapour pressure	0,17 Pa	0,17 Pa	0,17 Pa	0,17 Pa	0,17 Pa
Liquid weight fraction	1	1	1	1	1
Viscosity	medium (like oil)	medium (like oil)	medium (like oil)	medium (like oil)	medium (like oil)
Near/Far field	FF	FF	FF	NF	NF
Activity class	Activities with agitated surfaces	Activities with agitated surfaces	Activities with agitated surfaces	Falling liquids	Falling liquids
Situation	Open surface > 3 m²	Open surface > 3 m²	Open surface > 3 m²	Transfer of liquid product with flow of 100- 1000 L/minute	Transfer of liquid product with flow of > 1000 L/minute
Primary control measures	Low level of containment	Low level of containment	None	None	Low level of containment
Secondary control measures	None	None	None	None	None
Work area	Indoors	Indoors	Indoors	Indoors	Indoors
Room size and ventilation	Any size, 3 ACH	Any size, 3 ACH	Any size, 3 ACH	Any size, 3 ACH	Any size, 3 ACH
Long-term Inhalative Exposure Estimate (90th percentile full-shift exposure)	0.17 mg/m^3	0.17 mg/m^3	1.7 mg/m^3	1.2 mg/m3	0.4 mg/m3

Process category (PROC)	**9**	**10**	**13**	**14**	**8b**
Process temperature	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)
Vapour pressure	0,17 Pa	0,17 Pa	0,17 Pa	0,17 Pa	0,17 Pa
Liquid weight fraction	1	0.05	0.05	0.05	1
Viscosity	medium (like oil)	medium (like oil)	medium (like oil)	medium (like oil)	medium (like oil)
Near/Far field	NF	NF	NF	NF	NF
Activity class	Falling liquids	Spreading of liquid products	Activities with relatively undisturbed surfaces	Handling of contaminated objects (surface > 3 m²)	Falling liquids
Situation	Transfer of liquid product with flow of 10-100 L/minute	Spreading of liquids at surfaces or work pieces > 3 m² / hour	Open surface > 3 m²	Contamination 10-90 % of surface	Transfer of liquid product with flow of > 1000 L/minute
Primary control measures	None	None	None	None	Low level of containment
Secondary control measures	None	None	None	None	None
Work area	Indoors	Indoors	Indoors	Indoors	Indoors
Room size and ventilation	Any size, 3 ACH	Any size, 3 ACH	Any size, 3 ACH	Any size, 3 ACH	Any size, 3 ACH
Long-term Inhalative Exposure Estimate (90th percentile full-shift exposure)	0.4 mg/m3	0.067 mg/m3	0.00067 mg/m3	0.0002 mg/m3	0.4 mg/m3

Article II. Professional Uses

Process category (PROC)	**5**	**5**	**8a**	**8a**	**10**
Process temperature	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)
Vapour pressure	0,17 Pa	0,17 Pa	0,17 Pa	0,17 Pa	0,17 Pa
Liquid weight fraction	0.05	0.05	0.05	0.05	0.05
Viscosity	medium (like oil)	medium (like oil)	medium (like oil)	medium (like oil)	medium (like oil)
Near/Far field	FF	FF	NF	NF	NF
Activity class	Activities with agitated surfaces	Activities with agitated surfaces	Falling liquids	Falling liquids	Spreading of liquid products
Situation	Open surface > 3 m²	Open surface > 3 m²	Transfer of liquid product with flow of > 1000 L/minute	Transfer of liquid product with flow of > 1000 L/minute	Spreading of liquids at surfaces or work pieces > 3 m² / hour
Primary control measures	None	None	None	None	None
Secondary control measures	None	None	None	None	None
Work area	Indoors	Outdoors	Indoors	Outdoors	Indoors
Room size and ventilation	Any size, 3 ACH	-	Any size, 3 ACH	-	Any size, 3 ACH
Long-term Inhalative Exposure Estimate (90th percentile full-shift exposure)	0.087 mg/m3	0.0083 mg/m3	0.2 mg/m3	0.35 mg/m3	0.068 mg/m3

Process category (PROC)	**10**	**13**	**13**	**14**	**14**
Process temperature	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)	Room temperature (15- 25 °C)
Vapour pressure	0,17 Pa	0,17 Pa	0,17 Pa	0,17 Pa	0,17 Pa
Liquid weight fraction	0.05	0.05	0.05	0.05	0.05
Viscosity	medium (like oil)	medium (like oil)	medium (like oil)	medium (like oil)	medium (like oil)
Near/Far field	NF	NF	NF	NF	NF
Activity class	Spreading of liquid products	Activities with relatively undisturbed surfaces	Activities with relatively undisturbed surfaces	Handling of contaminated objects (surface > 3 m²)	Handling of contaminated objects (surface > 3 m²)
Situation	Spreading of liquids at surfaces or work pieces > 3 m² / hour	Open surface > 3 m²	Open surface > 3 m²	Contamination 10-90 % of surface	Contamination 10-90 % of surface
Primary control measures	None	None	None	None	None
Secondary control measures	None	None	None	None	None
Work area	Outdoors	Indoors	Outdoors	Indoors	Outdoors
Room size and ventilation	-	Any size, 3 ACH	-	Any size, 3 ACH	-
Long-term Inhalative Exposure Estimate (90th percentile full-shift exposure)	0.12 mg/m3	0.00067 mg/m3	0.0012 mg/m3	0.0002 mg/m3	0.00025 mg/m3