Example Exposure Scenarios in the e-SDS format

NLP Polyol #3: Ethylenediamine, propoxylated (EC number 500-035-6)

1. Classification and labelling according to CLP / GHS

Signal word: Warning

Hazard pictogram:

GHS07: exclamation mark

Hazard statements:

H319: Causes serious eye irritation.

Precautionary statements:

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337+P313: If eye irritation persists: Get medical advice/attention.

2. Classification and labelling according to DSD / DPD

Indication of danger:

Xi – irritant

R-phrases:

R36 - irritating to eyes

S-phrases:

S26 - in case of contact with eyes, rinse immediately with plenty of water and seek medical advice

On the next pages the ethylenediamine, propoxylated Exposure Scenarios (ES) in the e-SDS format are presented.

At the request of the consortia TNO clustered the eleven ES in the ethylenediamine, propoxylated CSR into five broad clusters following the life cycle tree of ethylenediamine, propoxylated.

ES cluster	Life cycle stage	Ethylenediamine, propoxylated
1	Manufacturing	ES 1: Manufacturing
2	**Manufacturing of other substances and Formulation, Repackaging and Distribution**	ES 2 + ES3
3	End uses – industrial	– Flexible Foam – Rigid foam – Coatings – Adhesives and sealants – Elastomers, TPU, Polyamide, Polyimide & Synthetic Fibres and Manufacturing of other Polymers – Composite Material Based on Wood/Man-Made/Mineral/Natural Fibres – Foundry – Other Composite Material
4	End uses – professional	– Rigid foam – Coatings – Adhesives and sealants – Composite Material Based on Wood/Man-Made/Mineral/Natural Fibres – Other Composite Material
5	End uses - consumer	– Coatings – Adhesives and sealants

Exposure scenario 1: Manufacturing of ethylenediamine, propoxylated

ES Annex to the e-SDS	
Section 1	**Exposure Scenario Title**
Title	**Manufacturing of ethylenediamine, propoxylated**
Use Descriptor	Sector of Use: SU 3, SU 8, SU 9
	Process Categories and Environmental Release Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 15 ERC 1, ERC 2, ERC 6c
Processes, tasks, activities covered	Covers: Industrial: ▪ PROC 1: Use in closed process, no likelihood of exposure. ▪ PROC 2: Use in closed continuous processes with occasional exposure ▪ PROC 3: Use in closed batch processes (synthesis or formulation) ▪ PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises ▪ PROC 5: Mixing or blending in batch process for formulation of preparations and articles (multistage and/or significant contact) ▪ PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at non-dedicated facilities ▪ PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at dedicated facilities ▪ PROC 15: Use as laboratory reagent
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	

Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Physical state: liquid
Concentration of substance in product	G13: Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	Not applicable.
Frequency and duration of use	G2: Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	None identified.
Contributing Scenarios	**Risk Management Measures** *Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures , 4. Personal protection*
All contributing scenarios at product temperatures **above** 111.5 °C	The high product temperatures above 111.5°C are assumed to prevent skin contact. Therefore, no mention is made of the need for gloves above this temperature, even though gloves to prevent burning by contact with hot material are expected to be used. - E54: Provide extract ventilation to points where emissions occur. - PPE30: If above technical/organisational control measures are not feasible, then adopt following PPE: - PPE22: Wear a respirator conforming to EN140 with Type A filter or better. Or - demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.
All contributing scenarios at product temperatures **below** 111.5°C	The description of RMM per contributing scenario is given for product temperatures below 111.5 °C only, while additional RMM for product temperatures above 111.5 °C are presented for all contributing scenarios together in the line above. The contributing scenarios for product temperatures below 111.5 °C include situations where product

	temperatures are not so high that skin contact is not expected. For these contributing scenarios the possible skin exposure is calculated and if the use of gloves is needed to ensure a total RCR below 1, this will be indicated in the specific contributing exposure scenarios.
PROC 1: Use in closed process, no likelihood of exposure.	- EI18: No specific measures identified.
PROC 2: Use in closed continuous processes with occasional exposure	- EI18: No specific measures identified.
PROC 3: Use in closed batch processes (synthesis or formulation)	- EI18: No specific measures identified.
PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises	- PPE 15: Wear suitable gloves tested to EN374.[1]
PROC 5: Mixing or blending in batch process for formulation of preparations and articles (multistage and/or significant contact)	- PPE 15: Wear suitable gloves tested to EN374.[1]
PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at non-dedicated	- PPE 15: Wear suitable gloves tested to EN374.[1]
PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at dedicated facilities	- PPE 15: Wear suitable gloves tested to EN374.[1]
PROC 15: Use as laboratory reagent	- EI18: No specific measures identified.
Section 2.2	**Control of environmental exposure**
Product characteristics	Substance is complex UVCB [PrC3].
	Non-hydrophobic [PrC4b].
	Not biodegradable [PrC5f].
Operational conditions	Indoor/Outdoor use [OOC3].

Amounts used	
Fraction of EU tonnage used in region [A1]:	0.321
Regional use tonnage (tonnes/year) [A2]:	8,500
Fraction of regional tonnage used locally [A3]:	1
Maximum daily site tonnage (kg/day) [A4].	28,333 (assuming 300 production days)
Frequency and duration of use	
Type of release	Intermittent release [FD1].
Emission days (days/year) [FD4]	1
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1].	11.2
Local marine water dilution factor [EF2].	199
Other given operational conditions affecting environmental exposure	Used in open and closed systems
	Dry processes.
Release fraction to air from process [OOC4].	$1.02 \cdot 10^{-4}$
Release fraction to wastewater from process [OOC5].	$\leq 2.35 \cdot 10^{-6}$
Release fraction to soil from process (regional only) [OOC6].	0
Risk Management Measures	
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used [TCS 1].
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil.	
Air:	No air emission controls required; required removal efficiency is 0% [TCR5].
Soil:	Soil emission controls are not applicable as there is no direct release to soil [TCR4].
Organizational measures to prevent/limit release from site	Prevent discharge of un-dissolved substance to or recover from wastewater [OMS1]. Do not apply industrial sludge to natural soils [OMS2].

Conditions and measures related to municipal sewage treatment plant	Domestic sewage treatment is not assumed [STP2].
Conditions and measures related to external treatment of waste for disposal	Not applicable.
Conditions and measures related to external recovery of waste	Not applicable.
Other environmental control measures additional to above	None.
Section 3	**Exposure Estimation**

3.1. Health

- For inhalation exposure the saturated vapour pressure was used for all PROCs
- For dermal exposure assessment the ECETOC TRA model V2 was used without the effect of LEV

PROC #	**Inhalation exposure – long term (mg/m^3)**	**RCR inhalation**	**Dermal exposure – long term (mg/kg BW/day)**	**RCR dermal**
PROC 1	48.7	0.50	0.343	0.025
PROC 2	48.7	0.50	1.37	0.10
PROC 3	48.7	0.50	0.343	0.025
PROC 4	48.7	0.50	1.37	0.10
PROC 5	48.7	0.50	2.74	0.20
PROC 8a	48.7	0.50	2.74	0.20
PROC 8b	48.7	0.50	1.37	0.10
PROC 15	48.7	0.50	0.343	0.025

3.2. Environment

Used EUSES model [EE4].

Compartment		**Predicted Environmental Concentration**	**Risk Characterisation Ratio**
Environment	Air (µg/m^3)	Not relevant.	
	Freshwater (mg/l)	0.064	0.042
	Marine water (mg/l)	$3.63 \cdot 10^{-3}$	0.427
	Freshwater sediment (mg/kg ww)	0.056	0.757
	Marine sediment (mg/kg ww)	$3.16 \cdot 10^{-3}$	0.427

	Agricultural soil (mg/kg ww)	$1.74 \cdot 10^{-3}$	0.109
	Grassland (mg/kg ww)	$1.74 \cdot 10^{-3}$	0.109
	Sewage Treatment Plant (mg/l)	2.39	0.034
Secondary poisoning	Aquatic foodchain (mg/kg)	Not relevant.	
	Aquatic marine foodchain (mg/kg)		
	Terrestrial foodchain (mg/kg)		
Humans exposed via the environment	Inhalation, long-term systemic (µg/m^3)	Not relevant.	
	Oral, long-term systemic (mg/kg bw/d)		
Section 4		**Guidance to check compliance with the Exposure Scenario**	
4.1. Health			
Guidance to DU		Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented [GC 22]	
		Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [GC 23]	
		Further information on the assumptions contained in this Exposure Scenario can be found at: [GC 24] ISOPA interpretation on selection of Use Descriptors	
4.2. Environment			
Not applicable			
Section 5			
Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)			
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.			
Control of Worker Exposure			

Control of environmental exposure

[1] use suitable eye protection when there is a likelihood of splashes, when the activities are done overhead or when workers need to be close to the source, e.g. for visual inspections.

Specific glove advice:

- Use chemical resistant gloves classified under Standard EN374: Protective glove against chemicals and micro-organisms.

Examples of preferred gloves barrier materials include:

- Butyl rubber
- Natural rubber (“latex”)
- Neoprene
- Nitrile/butadiene rubber (“nitrile”or “NBR”)
- Polyethylene
- Chlorinated polyethylene
- Ethyl vinyl alcohol laminate (“EVAL”)
- Polyvinyl alcohol (“PVA”)
- Polyvinyl chloride (“PVC” or “vinyl”)

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection:

- Use chemical goggles

Exposure scenario 2: Manufacturing of other substances and Formulating, Repackaging and Distribution

ES Annex to the e-SDS	
Section 1	**Exposure Scenario Title**
Title	**Manufacturing of other substances and Formulating, Repackaging and Distribution**
Use Descriptor	Sector of Use Manufacturing of other substances: SU 3, SU 8, SU 9 Sector of Use Formulating, Repackaging & Distribution: SU 3, SU 10
	Process Categories and Environmental Release Categories: <u>A) Manufacturing of other substances</u> PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 15 ERC 2, ERC 3, ERC 6a <u>B) Formulating, Repackaging & Distribution</u> PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 15 ERC 2, ERC 3, ERC 6c
Processes, tasks, activities covered	Covers: Industrial: ▪ PROC 1: Use in closed process, no likelihood of exposure. ▪ PROC 2: Use in closed continuous processes with occasional exposure ▪ PROC 3: Use in closed batch processes (synthesis or formulation) ▪ PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises ▪ PROC 5: Mixing or blending in batch process for formulation of preparations and articles (multistage and/or significant contact) ▪ PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at non-dedicated facilities ▪ PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at

	dedicated facilities ▪ PROC 9: Transfer of substance or preparation into small containers (e.g. dedicated[T1] filling line, including weighing) ▪ PROC 15: Use as laboratory reagent
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Physical state: liquid
Concentration of substance in product	G13: Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	Not applicable.
Frequency and duration of use	G2: Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	None identified.
Contributing Scenarios	**Risk Management Measures** *Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures , 4. Personal protection*
All contributing scenarios at product temperatures **above** 111.5 °C	The high product temperatures above 111.5°C are assumed to prevent skin contact. Therefore, no mention is made of the need for gloves above this temperature, even though gloves to prevent burning by contact with hot material are expected to be used. - E54: Provide extract ventilation to points where emissions occur. - PPE30: If above technical/organisational control measures are not feasible, then adopt following PPE: - PPE22: Wear a respirator conforming to EN140 with Type A filter or better. Or - demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and

	long-term.
All contributing scenarios at product temperatures **below** 111.5°C	The description of RMM per contributing scenario is given for product temperatures below 111.5 °C only, while additional RMM for product temperatures above 111.5 °C are presented for all contributing scenarios together in the line above. The contributing scenarios for product temperatures below 111.5 °C include situations where product temperatures are not so high that skin contact is not expected. For these contributing scenarios the possible skin exposure is calculated and if the use of gloves is needed to ensure a total RCR below 1, this will be indicated in the specific contributing exposure scenarios.
PROC 1: Use in closed process, no likelihood of exposure.	- EI18: No specific measures identified.
PROC 2: Use in closed continuous processes with occasional exposure	- EI18: No specific measures identified.
PROC 3: Use in closed batch processes (synthesis or formulation)	- EI18: No specific measures identified.
PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises	- PPE 15: Wear suitable gloves tested to EN374.[1]
PROC 5: Mixing or blending in batch process for formulation of preparations and articles (multistage and/or significant contact)	- PPE 15: Wear suitable gloves tested to EN374. [1]
PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at non-dedicated facilities	- PPE 15: Wear suitable gloves tested to EN374. [1]

PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at dedicated facilities	- PPE 15: Wear suitable gloves tested to EN374. [1]
PROC 9: Transfer of substance or preparation into small containers (e.g. dedicated filling line, including weighing[T2])	- PPE 15: Wear suitable gloves tested to EN374. [1]
PROC 15: Use as laboratory reagent	- EI18: No specific measures identified.
Section 2.2	**Control of environmental exposure**
Product characteristics	Substance is complex UVCB [PrC3].
	Non-hydrophobic [PrC4b].
	Not biodegradable [PrC5f].
Operational conditions	Indoor/Outdoor use [OOC3].
Amounts used	
Fraction of EU tonnage used in region [A1]:	0.321
Regional use tonnage (tonnes/year) [A2]:	6,770
Fraction of regional tonnage used locally [A3]:	0.739
Maximum daily site tonnage (kg/day) [A4].	16,667
Frequency and duration of use	
Type of release	Continuous release [FD2].
Emission days (days/year) [FD4]	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1].	10
Local marine water dilution factor [EF2].	100
Other given operational conditions affecting	Used in open and closed systems
	Dry processes.

environmental exposure	
Release fraction to air from process [OOC4].	$1.02 \cdot 10^{-4}$
Release fraction to wastewater from process [OOC5].	0
Release fraction to soil from process (regional only) [OOC6].	0
Risk Management Measures	
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used [TCS 1].
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil.	
Air:	No air emission controls required; required removal efficiency is 0% [TCR5].
Soil:	Soil emission controls are not applicable as there is no direct release to soil [TCR4].
Organizational measures to prevent/limit release from site	Prevent discharge of undissolved substance to or recover from wastewater [OMS1].
Conditions and measures related to municipal sewage treatment plant	Wastewater emission controls are not applicable as there is no direct release to wastewater [TCR3].
Conditions and measures related to external treatment of waste for disposal	Not applicable.
Conditions and measures related to external recovery of waste	Not applicable.
Other environmental control measures additional to above	None.
Section 3	**Exposure Estimation**
3.1. Health	

– For inhalation exposure the saturated vapour pressure was used for all PROCs
– For dermal exposure assessment the ECETOC TRA model V2 was used without the effect of LEV

PROC #	**Inhalation exposure –**	**RCR inhalatio**	**Dermal exposure – long**	**RCR dermal**

	long term (mg/m^3)	n	term (mg/kg BW/day)	
PROC 1	48.7	0.50	0.343	0.025
PROC 2	48.7	0.50	1.37	0.10
PROC 3	48.7	0.50	0.343	0.025
PROC 4	48.7	0.50	1.37	0.10
PROC 5	48.7	0.50	2.74	0.20
PROC 8a	48.7	0.50	2.74	0.20
PROC 8b	48.7	0.50	1.37	0.10
PROC 9	48.7	0.50	1.37	0.10
PROC 15	48.7	0.50	0.343	0.025

3.2. Environment

Used EUSES model [EE4].

	Compartment	Predicted Environmental Concentration	Risk Characterisation Ratio
Environment	Air ($\mu g/m^3$)	Not relevant.	
	Freshwater (mg/l)	$2.98 \cdot 10^{-4}$	$3.51 \cdot 10^{-3}$
	Marine water (mg/l)	$2.94 \cdot 10^{-5}$	$3.46 \cdot 10^{-3}$
	Freshwater sediment (mg/kg ww)	$2.60 \cdot 10^{-4}$	$3.51 \cdot 10^{-3}$
	Marine sediment (mg/kg ww)	$2.56 \cdot 10^{-5}$	$3.46 \cdot 10^{-3}$
	Agricultural soil (mg/kg ww)	$1.04 \cdot 10^{-3}$	0.065
	Grassland (mg/kg ww)	$1.04 \cdot 10^{-3}$	0.065
	Sewage Treatment Plant (mg/l)	Not relevant.	
Secondary poisoning	Aquatic foodchain (mg/kg)	Not relevant.	
	Aquatic marine foodchain (mg/kg)		
	Terrestrial foodchain (mg/kg)		
Humans	Inhalation, long-term	Not relevant.	

exposed via the environment	systemic (µg/m^3)	
	Oral, long-term systemic (mg/kg bw/d)	
Section 4		**Guidance to check compliance with the Exposure Scenario**
4.1. Health		
Guidance to DU		Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented [GC 22]
		Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [GC 23]
		Further information on the assumptions contained in this Exposure Scenario can be found at: [GC 24] ISOPA interpretation on selection of Use Descriptors
4.2. Environment		
Not applicable		
Section 5		
Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)		
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.		
Control of Worker Exposure		
Control of environmental exposure		

[1] use suitable eye protection when there is a likelihood of splashes, when the activities are done overhead or when workers need to be close to the source, e.g. for visual inspections.

Specific glove advice:

- Use chemical resistant gloves classified under Standard EN374: Protective glove against chemicals and micro-organisms.

Examples of preferred gloves barrier materials include:

- Butyl rubber
- Natural rubber (“latex”)

- Neoprene
- Nitrile/butadiene rubber (“nitrile”or “NBR”)
- Polyethylene
- Chlorinated polyethylene
- Ethyl vinyl alcohol laminate (“EVAL”)
- Polyvinyl alcohol (“PVA”)
- Polyvinyl chloride (“PVC” or “vinyl”)

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection:

- Use chemical goggles

Exposure Scenario 3: Industrial use of ethylenediamine, propoxylated

ES Annex to the e-SDS	
Section 1	**Exposure Scenario Title**
Title	**Industrial use of ethylenediamine, propoxylated**
Use Descriptor	Sector of Use: SU 3
	Process Categories and Environmental Release Categories <u>A) Industrial use in Flexible foam</u> PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC7, PROC 8a, PROC 8b, PROC 14, PROC 15, PROC 21 ERC 2, ERC 3, ERC 6c <u>B) Industrial use in Rigid foam</u> PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC10, PROC 15, PROC 21 ERC 2, ERC 3, ERC 6c <u>C) Industrial use in Coatings</u> PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 13, PROC 15 ERC 2, ERC 3, ERC 5, ERC 6c <u>D) Industrial use in Adhesives and sealants</u> PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 13, PROC 14, PROC 15 ERC 2, ERC 3, ERC 5, ERC 6c <u>E) Industrial use in Elastomers, TPU, Polyamide, Polyimide & Synthetic Fibres and Manufacturing of other Polymers</u> PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 9, PROC 14, PROC 15 ERC 2, ERC 3, ERC 6c <u>F) Industrial use in Composite Materials based on wood/man-made/mineral/natural fibres</u> PROC 1, PROC 2, PROC 3, PROC 4, PROC 7, PROC 8a, PROC 8b, PROC10, PROC 14, PROC 15, PROC 21 ERC 2, ERC 3, ERC 5 <u>G) Industrial use in Foundry</u> PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC

	8b, PROC 14, PROC 15 ERC 2, ERC 3, ERC 5 H) Industrial use in Other composite Materials PROC 1, PROC 2, PROC 3, PROC 5, PROC 8a, PROC 8b, PROC 13, PROC 14, PROC 15 ERC 2, ERC 3, ERC 5, ERC 6c
Processes, tasks, activities covered	Covers: Industrial: • 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 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) • PROC 7: Industrial spraying • PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities • PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at dedicated facilities [T3] • PROC 9: Transfer of substance or preparation into small containers (e.g. dedicated filling line, including weighing)[T4] • PROC 10: Roller application or brushing (e.g. rolling, brushing, Low energy spreading (e.g. One Component Foam use))[T5] • PROC 13: Treatment of articles by dipping and pouring • PROC 14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (e.g. non

	enclosed rebonding, pressing)[T6] • PROC 15: Use as laboratory reagent • PROC 21: Low energy manipulation of substances bound in materials and/or articles (e.g. demoulding, trimming, repairing, cutting, post pressing use[T7])
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Physical state: liquid, except PROC 21 (solid)
Concentration of substance in product	G13: Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	Not applicable.
Frequency and duration of use	G2: Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	None identified.
Contributing Scenarios	**Risk Management Measures** *Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures , 4. Personal protection*
All contributing scenarios at product temperatures **above** 111.5 °C	The high product temperatures above 111.5°C are assumed to prevent skin contact. Therefore, no mention is made of the need for gloves above this temperature, even though gloves to prevent burning by contact with hot material are expected to be used. - E54: Provide extract ventilation to points where emissions occur. - PPE30: If above technical/organisational control measures are not feasible, then adopt following PPE: - PPE22: Wear a respirator conforming to EN140 with Type A filter or better. Or

	- demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.
All contributing scenarios at product temperatures **below** 111.5°C	The description of RMM per contributing scenario is given for product temperatures below 111.5 °C only, while additional RMM for product temperatures above 111.5 °C are presented for all contributing scenarios together in the line above. The contributing scenarios for product temperatures below 111.5 °C include situations where product temperatures are not so high that skin contact is not expected. For these contributing scenarios the possible skin exposure is calculated and if the use of gloves is needed to ensure a total RCR below 1, this will be indicated in the specific contributing exposure scenarios.
PROC 1: Use in closed process, no likelihood of exposure	- EI18: No specific measures identified.
PROC 2: Use in closed, continuous process with occasional controlled exposure	- EI18: No specific measures identified.
PROC 3: Use in closed batch process (synthesis or formulation)	- EI18: No specific measures identified.
PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises	- PPE 15: Wear suitable gloves tested to EN374.[1]
PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or	- PPE 15: Wear suitable gloves tested to EN374. [1]

significant contact)	
PROC 7: Industrial spraying	- PPE 15: Wear suitable gloves tested to EN374.[2] - PPE 26: Use suitable eye protection.[2]
PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	- PPE 15: Wear suitable gloves tested to EN374.[1]
PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at dedicated facilities[T8]	- PPE 15: Wear suitable gloves tested to EN374.[1]
PROC 9: Transfer of substance or preparation into small containers (e.g. dedicated filling line, including weighing)[T9]	- PPE 15: Wear suitable gloves tested to EN374.[1]
PROC 10: Roller application or brushing (e.g. rolling, brushing, Low energy spreading (e.g. One Component Foam use)) [T10]	- PPE 15: Wear suitable gloves tested to EN374.[1] - PPE 26: Use suitable eye protection.[1]
PROC 13: Treatment of articles by dipping and pouring	- PPE 15: Wear suitable gloves tested to EN374.[1]
PROC 14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (e.g. non enclosed rebonding, pressing[T11])	- EI18: No specific measures identified.
PROC 15: Use as laboratory reagent	- EI18: No specific measures identified.

PROC 21: Low energy manipulation of substances bound in materials and/or articles (e.g. demoulding, trimming, repairing, cutting, post pressing use[T12])		- EI18: No specific measures identified.
Section 2.2		**Control of environmental exposure**
Product characteristics		Substance is complex UVCB [PrC3].
		Non-hydrophobic [PrC4b].
		Not biodegradable [PrC5f].
Operational conditions		Indoor/Outdoor use [OOC3].
Amounts used		
Fraction of EU tonnage used in region [A1]:		0.321
Regional use tonnage (tonnes/year) [A2]:	All uses, except:	545
	Rigid foam	5,770
	Coatings	577
Fraction of regional tonnage used locally [A3]:	All uses, except:	0.917
	Rigid foam	0.173
	Coatings	0.867
Maximum daily site tonnage (kg/day) [A4].	All uses, except:	25,000
	Rigid foam	10,000
Frequency and duration of use		
Type of release		Continuous release [FD2].
Emission days (days/year) [FD4]	All uses, except:	20
	Rigid foam	100
Environmental factors not influenced by risk management		
Local freshwater dilution factor [EF1].		10
Local marine water dilution factor [EF2].		100
Other given operational		Used in open and closed systems

conditions affecting environmental exposure	Dry processes.
Release fraction to air from process [OOC4].	$1.02 \cdot 10^{-4}$
Release fraction to wastewater from process [OOC5].	0
Release fraction to soil from process (regional only) [OOC6].	0
Risk Management Measures	
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used [TCS 1].
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil.	
Air:	No air emission controls required; required removal efficiency is 0% [TCR5].
Soil:	Soil emission controls are not applicable as there is no direct release to soil [TCR4].
Organizational measures to prevent/limit release from site	Prevent discharge of un-dissolved substance to or recover from wastewater [OMS1].
Conditions and measures related to municipal sewage treatment plant	Wastewater emission controls are not applicable as there is no direct release to wastewater [TCR3].
Conditions and measures related to external treatment of waste for disposal	Not applicable.
Conditions and measures related to external recovery of waste	Not applicable.
Other environmental control measures additional to above	None.
Section 3	**Exposure Estimation**
3.1. Health	
– For inhalation exposure the saturated vapour pressure was used for all PROCs to calculate	

worst case exposure at temperatures up to 111.5 C except for PROCs 7 and 10

– For PROCs and 7 and 10 a read-across was done using measured occupational hygiene data of MDI inhalation exposure during spraying
– For dermal exposure assessment the ECETOC TRA model V2 was used without the effect of LEV

PROC #	**Inhalation exposure – long term (mg/m^3)**	**RCR inhalation**	**Dermal exposure – long term (mg/kg BW/day)**	**RCR dermal**
PROC 1	48.7	0.50	0.343	0.025
PROC 2	48.7	0.50	1.37	0.10
PROC 3	48.7	0.50	0.343	0.025
PROC 4	48.7	0.50	1.37	0.10
PROC 5	48.7	0.50	2.74	0.20
PROC 7	0.870	0.01	8.51	0.61
PROC 8a	48.7	0.50	2.74	0.20
PROC 8b	48.7	0.50	1.37	0.10
PROC 9	48.7	0.50	1.37	0.10
PROC 10	0.870	0.01	5.49	0.41
PROC 13	48.7	0.50	2.74	0.20
PROC 14	48.7	0.50	3.43	0.25
PROC 15	48.7	0.50	0.343	0.025
PROC 21	48.7	0.50	2.83	0.20

3.2. Environment

Used EUSES model [EE4].

Compartment		**Predicted Environmental Concentration**	**Risk Characterisation Ratio**
Environment	Air (µg/m^3)	Not relevant.	
	Freshwater (mg/l)	$2.98 \cdot 10^{-4}$	$3.51 \cdot 10^{-3}$
	Marine water (mg/l)	$2.94 \cdot 10^{-5}$	$3.46 \cdot 10^{-3}$
	Freshwater sediment (mg/kg	$2.60 \cdot 10^{-4}$	$3.51 \cdot 10^{-3}$

	ww)		
	Marine sediment (mg/kg ww)	$2.56 \cdot 10^{-5}$	$3.46 \cdot 10^{-3}$
	Agricultural soil (mg/kg ww)		
	All uses, except:	$1.04 \cdot 10^{-4}$	$6.50 \cdot 10^{-3}$
	Rigid foam	$2.37 \cdot 10^{-4}$	0.015
	Grassland (mg/kg ww)		
	All uses, except:	$1.04 \cdot 10^{-4}$	$6.50 \cdot 10^{-3}$
	Rigid foam	$2.37 \cdot 10^{-4}$	0.015
	Sewage Treatment Plant (mg/l)	Not relevant.	
Secondary poisoning	Aquatic foodchain (mg/kg)	Not relevant.	
	Aquatic marine foodchain (mg/kg)		
	Terrestrial foodchain (mg/kg)		
Humans exposed via the environment	Inhalation, long-term systemic ($\mu g/m^3$)	Not relevant.	
	Oral, long-term systemic (mg/kg bw/d)		
Section 4		**Guidance to check compliance with the Exposure Scenario**	
4.1. Health			
Guidance to DU		Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented [GC 22]	
		Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [GC 23]	
		Further information on the assumptions contained in this Exposure Scenario can be found at: [GC 24] ISOPA interpretation on selection of Use Descriptors	
4.2. Environment			
Not applicable			

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

[1] use suitable eye protection when there is a likelihood of splashes, when the activities are done overhead or when workers need to be close to the source, e.g. for visual inspections.
[2] use suitable eye protection at all times during this activity.

Specific glove advice:

- Use chemical resistant gloves classified under Standard EN374: Protective glove against chemicals and micro-organisms.

Examples of preferred gloves barrier materials include:

- Butyl rubber
- Natural rubber (“latex”)
- Neoprene
- Nitrile/butadiene rubber (“nitrile”or “NBR”)
- Polyethylene
- Chlorinated polyethylene
- Ethyl vinyl alcohol laminate (“EVAL”)
- Polyvinyl alcohol (“PVA”)
- Polyvinyl chloride (“PVC” or “vinyl”)

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection:

- Use chemical goggles

Exposure Scenario 4: Professional use of ethylenediamine, propoxylated

ES Annex to the e-SDS	
Section 1	**Exposure Scenario Title**
Title	**Professional use of ethylenediamine, propoxylated**
Use Descriptor	Sector of Use: SU 22
	Process Categories and Environmental Release Categories: A) Professional use in Rigid foam PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11 ERC 8c, ERC 8f B) Professional use in Coatings PROC 5, PROC 8a, PROC 10, PROC 11, PROC 13 ERC 8c, ERC 8f C) Professional use in Adhesives and sealants PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11, PROC 13 ERC 8c, ERC 8f D) Composite Material Based on Wood/Man-Made/Mineral/Natural Fibres PROC 3, PROC 4, PROC 5, PROC 8a, PRO 8b, PROC 10, PROC 11, PROC 15, PROC 21 ERC8c, ERC8f E) Professional use in Other Composite Materials PROC 2, PROC 3, PROC 5, PROC 8a, PROC 14 ERC 8c, ERC 8f
Processes, tasks, activities covered	Covers: Professional: ▪ 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 for formulation of preparations and articles (multistage

	and/or significant contact) ▪ PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities ▪ PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at dedicated facilities[T13] ▪ PROC10: Roller application or brushing (e.g. rolling, brushing, low energy spreading (e.g.one component foam use[T14]) ▪ PROC 11: Non industrial spraying ▪ PROC 13: Treatment of articles by dipping and pouring ▪ PROC 14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (e.g[T15]. pressing) ▪ PROC 15: Use as laboratory reagent[T16] ▪ PROC 21: Low energy manipulation of substances bound in materials and/or articles (e.g. demoulding, trimming, repairing, cutting, post pressing use[T17])
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Physical state: liquid, except PROC 21 (solid).
Concentration of substance in product	G13: Covers percentage substance in the product up to 100 % (unless stated differently). Exception PROC 11: up to 50%
Amounts used	Not applicable.
Frequency and duration of use	G2: Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	None identified.
Contributing Scenarios	**Risk Management Measures** *Note: list RMM standard phrases according to the control*

	hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures , 4. Personal protection
All contributing scenarios at product temperatures **above** 111.5 °C	The high product temperatures above 111.5°C are assumed to prevent skin contact. Therefore, no mention is made of the need for gloves above this temperature, even though gloves to prevent burning by contact with hot material are expected to be used. - E54: Provide extract ventilation to points where emissions occur. - PPE30: If above technical/organisational control measures are not feasible, then adopt following PPE: - PPE22: Wear a respirator conforming to EN140 with Type A filter or better. Or - demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.
All contributing scenarios at product temperatures **below** 111.5°C	The description of RMM per contributing scenario is given for product temperatures below 111.5 °C only, while additional RMM for product temperatures above 111.5 °C are presented for all contributing scenarios together in the line above. The contributing scenarios for product temperatures below 111.5 °C include situations where product temperatures are not so high that skin contact is not expected. For these contributing scenarios the possible skin exposure is calculated and if the use of gloves is needed to ensure a total RCR below 1, this will be indicated in the specific contributing exposure scenarios.
PROC 2: Use in closed, continuous process with occasional controlled exposure	- EI18: No specific measures identified.
PROC 3: Use in closed batch process (synthesis or formulation)	- EI18: No specific measures identified.
PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises	- PPE 15: Wear suitable gloves tested to EN374[1]
PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant	- PPE 15: Wear suitable gloves tested to EN374. [1]

contact)		
PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities		- PPE 15: Wear suitable gloves tested to EN374. [1]
PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/ large containers at dedicated facilities		- PPE 15: Wear suitable gloves tested to EN374. [1]
PROC10: Roller application or brushing (e.g. rolling, brushing, low energy spreading (e.g.one component foam use[T18])		- PPE 15: Wear suitable gloves tested to EN374.[1] - PPE 26: use suitable eye protection.[1]
PROC 11: Non industrial spraying		- PPE 15: Wear suitable gloves tested to EN374.[2] - PPE 26: Use suitable eye protection.[2]
PROC 13: Treatment of articles by dipping and pouring		- PPE 15: Wear suitable gloves tested to EN374. [1]
PROC 14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (e.g. pressing[T19])		- EI18: No specific measures identified.
PROC 15: Use as laboratory reagent		- EI18: No specific measures identified.
PROC 21: Low energy manipulation of substances bound in materials and/or articles (e.g. demoulding, trimming, repairing, cutting, post pressing use[T20])		- EI18: No specific measures identified
Section 2.2		**Control of environmental exposure**
Product characteristics		Substance is complex UVCB [PrC3].
		Non-hydrophobic [PrC4b].
		Not biodegradable [PrC5f].
Operational conditions		Indoor/Outdoor use [OOC3].
Amounts used		
Fraction of EU tonnage used in region [A1]:		0.321
Regional use tonnage (tonnes/year) [A2]:	All uses, except:	545

	Rigid foam	5,770
	Coatings	577
Fraction of regional tonnage used locally [A3]:		$2.00 \cdot 10^{-3}$
Maximum daily site tonnage (kg/day) [A4].	All uses, except:	2.99
	Rigid foam	31.6
	Coatings	3.16
Frequency and duration of use		
Type of release		Dispersive use [FD3].
Emission days (days/year) [FD4]		365
Environmental factors not influenced by risk management		
Local freshwater dilution factor [EF1].		10
Local marine water dilution factor [EF2].		100
Release fraction to wastewater from process [OOC5].		0
Release fraction to soil from process (regional only) [OOC6].		$5.0 \cdot 10^{-3}$
Risk Management Measures		
Technical conditions and measures at process level (source) to prevent release		Common practices vary across sites thus conservative process release estimates used [TCS 1].

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil.	
Air:	No air emission controls required; required removal efficiency is 0% [TCR5].
Soil:	No soil emission controls required; required removal efficiency is 0% [TCR 7].
Organizational measures to prevent/limit release from site	Prevent discharge of un-dissolved substance to or recover from wastewater [OMS1].
Conditions and measures related to municipal sewage treatment plant	Wastewater emission controls are not applicable as there is no direct release to wastewater [TCR3].
Conditions and measures related to external treatment of waste for disposal	Not applicable.
Conditions and measures	Not applicable.

related to external recovery of waste	
Other environmental control measures additional to above	None.
Section 3	**Exposure Estimation**

3.1. Health

- For worker inhalation exposure the saturated vapour pressure was used to calculate worst case exposure at temperatures up to 111.5 ºC for all PROCs except for PROC 10 and 11
- For PROCs and 10 and 11 a read-across was done using measured occupational hygiene data of MDI inhalation exposure during spraying
- For dermal exposure assessment the ECETOC TRA model V2 was used without the effect of LEV

PROC #	**Inhalation exposure – long term (mg/m^3)**	**RCR inhalation**	**Dermal exposure – long term (mg/kg BW/day)**	**RCR dermal**
PROC 2	48.7	0.50	1.37	0.01
PROC 3	48.7	0.50	0.343	0.025
PROC 4	48.7	0.50	0.686	0.10
PROC 5	48.7	0.50	2.74	0.20
PROC 8a	48.7	0.50	2.74	0.20
PROC 8b	48.7	0.50	1.37	0.10
PROC 10	0.87	0.01	2.74	5.49
PROC 11	0.87	0.01	10.7	0.77
PROC 13	48.7	0.50	2.74	0.20
PROC 14	48.7	0.50	3.43	0.20
PROC 15	48.7	0.50	0.343	0.025
PROC 21	48.7	0.50	2.829	0.20

3.2. Environment

Used EUSES model [EE4].

Compartment		**PEC**	**Risk Characterisation Ratio**
Environment	Air (µg/m^3)	Not relevant.	
	Freshwater (mg/l)	$2.98 \cdot 10^{-4}$	$3.51 \cdot 10^{-3}$

	Marine water (mg/l)	$2.94 \cdot 10^{-5}$	$3.46 \cdot 10^{-3}$
	Freshwater sediment (mg/kg ww)	$2.60 \cdot 10^{-4}$	$3.51 \cdot 10^{-3}$
	Marine sediment (mg/kg ww)	$2.56 \cdot 10^{-5}$	$3.46 \cdot 10^{-3}$
	Agricultural soil (mg/kg ww)	$3.67 \cdot 10^{-5}$	$2.29 \cdot 10^{-3}$
	Grassland (mg/kg ww)	$3.67 \cdot 10^{-5}$	$2.29 \cdot 10^{-3}$
	Sewage Treatment Plant (mg/l)	Not relevant.	
Secondary poisoning	Aquatic foodchain (mg/kg)	Not relevant.	
	Aquatic marine foodchain (mg/kg)		
	Terrestrial foodchain (mg/kg)		
Humans exposed via the environment	Inhalation, long-term systemic ($\mu g/m^3$)	Not relevant.	
	Oral, long-term systemic (mg/kg bw/d)		
Section 4		**Guidance to check compliance with the Exposure Scenario**	
4.1. Health			
Guidance to DU		Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented [GC 22]	
		Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [GC 23]	
		Further information on the assumptions contained in this Exposure Scenario can be found at: [GC 24] ISOPA interpretation on selection of Use Descriptors	
4.2. Environment			
Not applicable			

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

[1] use suitable eye protection when there is a likelihood of splashes, when the activities are done overhead or when workers need to be close to the source, e.g. for visual inspections.
[2] use suitable eye protection at all times during this activity.

Specific glove advice:

- Use chemical resistant gloves classified under Standard EN374: Protective glove against chemicals and micro-organisms.

Examples of preferred gloves barrier materials include:

- Butyl rubber
- Natural rubber (“latex”)
- Neoprene
- Nitrile/butadiene rubber (“nitrile”or “NBR”)
- Polyethylene
- Chlorinated polyethylene
- Ethyl vinyl alcohol laminate (“EVAL”)
- Polyvinyl alcohol (“PVA”)
- Polyvinyl chloride (“PVC” or “vinyl”)

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection:

- Use chemical goggles

Exposure Scenario 5. Consumer use of ethylenediamine, propoxylated

ES Annex to the e-SDS	
Section 1	**Exposure Scenario Title**
Title	**End uses of ethylenediamine, propoxylated by consumers**
Use Descriptor	Sector of Use: SU 21
	Product category: PC 1, PC 9a,
	Environmental Release Categories: ERC 8c, ERC 8f
Processes, tasks, activities covered	Covers: Consumer use of **ethylenediamine, propoxylated** in: • Coatings • Adhesives and sealants
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	
Section 2.2	**Control of consumer exposure**
Product characteristics	Covers concentrations up to [ConsOC1]: • Coatings, paints: 40% • Adhesives and sealants: 60%
Physical form of product	Physical state: liquid
Contributing Scenarios	**Operations conditions (only applicable to consumer)**
PC 1: Adhesives, sealants Sealants joints	– Covers skin contact area up to 2 cm^2 [ConsOC5]; – For each use event, covers use amounts up to 75 g [ConsOC2]; – Covers use in room size of 10 m^3[ConsOC11]; – For each use event, covers exposure up to 4.00 hr/event [ConsOC14];
PC 1: Adhesives, sealants Sealants assembly	– Covers skin contact area up to 43 cm^2 [ConsOC5]; – For each use event, covers use amounts up to 390 g [ConsOC2]; – Covers use in room size of 20 m^3[ConsOC11]; – For each use event, covers exposure up to 4.00 hr/event [ConsOC14];
PC1: Adhesives, sealants Adhesive hotmelt	– Covers skin contact area up to 43 cm^2 [ConsOC5]; – For each use event, covers use amounts up to 65 g [ConsOC2];

	– Covers use in room size of 20 m^3[ConsOC11]; – For each use event, covers exposure up to 4.00 hr/event [ConsOC14];
PC9a: Coatings, paints Use of 2-component paint, high solid	– For each use event, covers use amounts up to 1300 g [ConsOC2]; – Covers use in room size of 20 m^3[ConsOC11]; – For each use event, covers exposure up to 4.00 hr/event [ConsOC14];
PC9a: Coatings, paints Mixing and loading of 2-component solid paint	– For each use event, covers use amounts up to 1300 g [ConsOC2]; – Covers use in room size of 1 m^3[ConsOC11]; – For each use event, covers exposure up to 15 minutes/event [ConsOC14];
PC9a: Coatings, paints Floor coating-high solid	– Covers skin contact area up to 108 cm^2 [ConsOC5]; – For each use event, covers use amounts up to 3000 g [ConsOC2]; – Covers use in room size of 34 m^3[ConsOC11]; – For each use event, covers exposure up to 4.00 hr/event [ConsOC14];
Section 2.2	**Control of environmental exposure**
Product characteristics	Substance is complex UVCB [PrC3].
	Non-hydrophobic [PrC4b].
	Not biodegradable [PrC5f].
Operational conditions	Indoor/Outdoor use [OOC3].

Amounts used		
Fraction of EU tonnage used in region [A1]:		0.321
Regional use tonnage (tonnes/year) [A2]:	Coatings	577
	Adhesives and sealants	545
Fraction of regional tonnage used locally [A3]:		$2.00 \cdot 10^{-3}$
Maximum daily site tonnage (kg/day) [A4].	Coatings	3.16
	Adhesives and sealants	2.
Frequency and duration of use		

Type of release	Dispersive use [FD3].
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1].	10
Local marine water dilution factor [EF2].	100
Release fraction to air from process [OOC4].	$1.02 \cdot 10^{-4}$
Release fraction to waste-water from process [OOC5].	0
Release fraction to soil from process (regional only) [OOC6].	$5.0 \cdot 10^{-3}$
Risk Management Measures	
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used [TCS 1].
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil.	
Air:	No air emission controls required; required removal efficiency is 0% [TCR5].
Soil:	No soil emission controls required; required removal efficiency is 0% [TCR 7].
Organizational measures to prevent/limit release from site	Prevent discharge of un-dissolved substance to or recover from wastewater [OMS1].
Conditions and measures related to municipal sewage treatment plant	Wastewater emission controls are not applicable as there is no direct release to wastewater [TCR3].
Conditions and measures related to external treatment of waste for disposal	Not applicable.
Conditions and measures related to external recovery of waste	Not applicable.

Other environmental control measures additional to above	None.
Section 3	**Exposure Estimation**
3.1. Health	
– [G31]: The ConsExpo model has been used to estimate consumer exposures unless otherwise indicated	

Relevant Use Sentinel Product	**RCR inhalation – long term exposure (year average)**	**RCR inhalation – long term exposure (day average)**	**RCR dermal systemic long term**	**RCR systemic (all routes, long term)**
PC 1: Adhesives, sealants Sealants joints	0.000	0.031	0.010	0.041
PC 1: Adhesives, sealants Sealants assembly	0.000	0.033	0.003	0.036
PC 1: Adhesives, sealants Adhesive hotmelt	0.000	0.034	0.008	0.042
PC 9a: Coatings, paints Use of 2-component paint, high solid	0.000	0.017	0.016	0.031
PC 9a: Coatings, paints Mixing and loading of 2-component solid paint	0.000	0.001	<0.000	0.001

PC 9a: Coatings, paints Floor coating-high solid	0.000	0.017	0.001	0.019

3.2. Environment

Used EUSES model [EE4].

	Compartment	Predicted Environmental Concentration	Risk Characterisation Ratio
Environment	Air (µg/m^3)	Not relevant.	
	Freshwater (mg/l)	$2.98 \cdot 10^{-4}$	$3.51 \cdot 10^{-3}$
	Marine water (mg/l)	$2.94 \cdot 10^{-5}$	$3.46 \cdot 10^{-3}$
	Freshwater sediment (mg/kg ww)	$2.60 \cdot 10^{-4}$	$3.51 \cdot 10^{-3}$
	Marine sediment (mg/kg ww)	$2.56 \cdot 10^{-5}$	$3.46 \cdot 10^{-3}$
	Agricultural soil (mg/kg ww)	$3.67 \cdot 10^{-5}$	$2.29 \cdot 10^{-3}$
	Grassland (mg/kg ww)	$3.67 \cdot 10^{-5}$	$2.29 \cdot 10^{-3}$
	Sewage Treatment Plant (mg/l)	Not relevant.	
Secondary poisoning	Aquatic foodchain (mg/kg)	Not relevant.	
	Aquatic marine foodchain (mg/kg)		
	Terrestrial foodchain (mg/kg)		
Humans exposed via the environment	Inhalation, long-term systemic (µg/m^3)	Not relevant.	
	Oral, long-term systemic (mg/kg bw/d)		

Section 4	**Guidance to check compliance with the Exposure Scenario**

4.1. Health

Guidance to DU	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented [GC 22]
	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [GC 23]
	Further information on the assumptions contained in this Exposure Scenario can be found at: [GC 24] ISOPA interpretation on selection of Use Descriptors
4.2. Environment	
Not applicable	
Section 5	
Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)	
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of consumer exposure	
Control of environmental exposure	