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

1.1 Product identifier

Trade name	:	ARALDITE DY-E CI
REACH Registration Number	:	01-2119485289-22
Substance name	:	Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.
CAS-No.	:	68609-97-2
EC-No.	:	271-846-8

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

Use of the Substance/Mixture	:	Coatings

ES1: Formulation or re-packing, Industrial
ES2: Use at industrial site leading to inclusion into/onto article
ES3: Professional use
ES4: Consumer application of coatings, Consumer use
ES5: Manufacture of the substance Industrial uses
ES6: Formulation or repacking of adhesives Industrial uses
ES7: End use industrial Use in adhesives/sealants at industrial sites - 1 Industrial uses
ES8: End use industrial Use in adhesives/sealants at industrial sites - 2 Industrial uses
ES9: Manufacture of electro isolators, engines and electronic components through casting and impregnation Industrial uses
ES10: Industrial use of liquid paints as corrosion protection coatings Industrial uses
ES11: Professional use flooring (spreading and rolling, no brushing) Professional uses
ES12: Service life for plastic articles produced at Industrial Sites Industrial uses
ES13: Service life for plastic articles used by professionals Professional uses

Recommended restrictions on use	:	For industrial use only.

1.3 Details of the supplier of the safety data sheet

Company	:	Huntsman Advanced Materials (Europe) BV
Address	:	Grijpenlaan 18 3300 Tienen Belgium
Telephone	:	+41 61 299 20 41
Telefax	:	+41 61 299 20 40
E-mail address of person responsible for the SDS	:	Global_Product_EHS_AdMat@huntsman.com

1.4 Emergency telephone number

Emergency telephone number	:	Berlin: 0049 30 19 24 0 & 0049 30 30 68 6 7 11 Bonn: 0049 228 19 27 0 & 0049 228 28 7 3 32 11 Erfurt: 0049 361 73 07 30 Freiburg: 0049 761 16 24 0 Göttingen: 0049 51 19 24 0 & 0049 551 38 31 80

Homburg: 0049 6841 19 24 0
Mainz: 0049 6131 19 24 0 & 0049 6131 23 24 66
München: 0049 89 19 24 0
Nürnberg: 0049 911 39 8 2 45 1
EUROPE: +32 35 75 1234
France ORFILA: +33(0)145425959
ASIA: +65 6336-6011
China: +86 20 39377888
+86 532 83889090
India: + 91 22 42 87 5333
Australia: 1800 786 152
New Zealand: 0800 767 437
USA: +1 800-424-9300

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Skin irritation, Category 2	H315: Causes skin irritation.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Reproductive toxicity, Category 1B	H360F: May damage fertility.

2.2 Label elements

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements :

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H360F	May damage fertility.

Precautionary statements :

Prevention:

P201	Obtain special instructions before use.
P261	Avoid breathing mist or vapours.
P264	Wash skin thoroughly after handling.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.

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

Substance name : Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.

EC-No. : 271-846-8

Hazardous components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)	M-Factor, SCL, ATE
Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	68609-97-2 271-846-8	>= 90 - <= 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.
Treat symptomatically.
Get medical attention if symptoms occur.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
No action shall be taken involving any personal risk or without suitable training.
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.

In case of skin contact	:	If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	:	Flush eyes with water as a precaution. Remove contact lenses. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

Risks	:	Causes skin irritation. May cause an allergic skin reaction. May damage fertility.

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	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	Exercise caution when using a high volume water jet as it may scatter and spread fire

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	No hazardous combustion products are known

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Refer to protective measures listed in sections 7 and 8.

6.2 Environmental precautions

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

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Neutralise with acid.
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 disposal considerations see section 13., See Section 1 for emergency contact information., For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons.
Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
Do not breathe vapours/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Dispose of rinse water in accordance with local and national regulations.

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

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

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	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. Observe label precautions. Keep in properly labelled containers.
Advice on common storage	:	Do not store near acids.
Storage class (TRGS 510)	:	6.1C
Further information on storage stability	:	Stable under normal conditions.
Recommended storage temperature	:	2 - 40 °C

7.3 Specific end use(s)

Specific use(s)	:	See Annex to the Safety data sheet for additional information in the Exposure Scenario(s). No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

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
Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	Workers	Inhalation	Long-term systemic effects	0,49 mg/m3
	Workers	Dermal	Long-term systemic effects	0,75 mg/kg

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

Substance name	Environmental Compartment	Value
Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	Fresh water	1,12 mg/l
	Marine water	0,112 mg/l
	Freshwater - intermittent	0,072 mg/l
	Sewage treatment plant	10 mg/l
	Fresh water sediment	1,05 mg/kg
	Marine sediment	0,105 mg/kg
	Soil	20 mg/kg

8.2 Exposure controls

Personal protective equipment

Eye/face protection	:	Eye wash bottle with pure water Tightly fitting safety goggles
Hand protection		
Material	:	butyl-rubber
Break through time	:	> 8 h
Material	:	Nitrile rubber
Break through time	:	10 - 480 min
Remarks	:	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Respiratory protection	:	No personal respiratory protective equipment normally required. Wear respiratory protection when its use is identified for certain contributing scenario.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	Clear
Odour	:	mild
Odour Threshold	:	No data is available on the product itself.
Melting point/freezing point	:	No data is available on the product itself.
Boiling point	:	> 200 °C (1 013 hPa)
Flammability (solid, gas)	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Upper explosion limit / Upper	:	No data is available on the product itself.

flammability limit

Flash point	:	142 °C Method: Pensky-Martens closed cup
Auto-ignition temperature	:	No data is available on the product itself.
Decomposition temperature	:	> 200 °C
pH	:	10 (20 °C) Concentration: 500 g/l
Viscosity		
Viscosity, dynamic	:	5 - 15 mPa.s (25 °C)
Solubility(ies)		
Water solubility	:	practically insoluble (20 °C)
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Vapour pressure	:	0,0001 hPa (20 °C)
Density	:	ca. 0,9 g/cm3 (25 °C)
Relative density	:	ca. 0,9 (25 °C)
Relative vapour density	:	No data is available on the product itself.
Particle characteristics	:	No data is available on the product itself.

9.2 Other information

No data is available on the product itself.

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : No hazards to be specially mentioned.

10.4 Conditions to avoid

Conditions to avoid : None known.

10.5 Incompatible materials

Materials to avoid : None known.

10.6 Hazardous decomposition products

Carbon dioxide (CO2)
Carbon monoxide
Burning produces noxious and toxic fumes.
No hazardous decomposition products are known.

SECTION 11: Toxicological information

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

Acute toxicity

Not classified due to lack of data.

Components:

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Acute oral toxicity	:	LD50 (Rat, male): ca. 26,8 g/kg Method: Other guidelines
Acute inhalation toxicity	:	LC0 (Rat): > 0,15 mg/l Exposure time: 7 h Test atmosphere: vapour Method: Other guidelines
Acute dermal toxicity	:	(Rabbit, male): > 4 000 mg/kg, 4,5 ml/kg Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Causes skin irritation.

Components:

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Species	:	Rabbit
Exposure time	:	24 h
Method	:	Acute Dermal Toxicity
Result	:	Skin irritation

Serious eye damage/eye irritation

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

Components:

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Species	:	Rabbit
Assessment	:	No eye irritation
Method	:	OECD Test Guideline 405
Result	:	slight irritation

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified due to lack of data.

Components:

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Test Type	:	Buehler Test
Exposure routes	:	Skin
Species	:	Guinea pig
Method	:	OPPTS 870.2600
Result	:	May cause sensitisation by skin contact.
Result	:	May cause sensitisation by skin contact.
Remarks	:	The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.

Germ cell mutagenicity

Not classified due to lack of data.

Components:

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Genotoxicity in vitro	:	Test Type: Ames test Test system: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: positive Test Type: In vitro mammalian cell gene mutation test Test system: Chinese hamster ovary cells Concentration: 0,5 - 5.000 µg/mL Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 476 Result: negative
Genotoxicity in vivo	:	Test Type: In vivo micronucleus test Species: Mouse (male and female) Cell type: Bone marrow Application Route: Intraperitoneal injection Exposure time: 24 hr, 48 hr, and 72 hr Method: OECD Test Guideline 474 Result: negative

Carcinogenicity

Not classified due to lack of data.

Reproductive toxicity

May damage fertility.

Components:

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Effects on fertility	:	Species: Rat, male and female Application Route: Oral General Toxicity - Parent: NOAEL: 40 mg/kg body weight General Toxicity F1: NOAEL: 10 mg/kg body weight Method: OECD Test Guideline 443
Effects on foetal development	:	Species: Rat, female Application Route: Dermal Duration of Single Treatment: 6 h General Toxicity Maternal: NOAEL: 200 mg/kg body weight Developmental Toxicity: NOAEL: 200 mg/kg body weight Method: OECD Test Guideline 414 Result: No teratogenic effects Species: Rabbit, female Application Route: Oral Dose: 40, 125, 375 milligram per kilogram General Toxicity Maternal: NOAEL: 375 mg/kg body weight Developmental Toxicity: NOAEL: 375 mg/kg body weight Method: OECD Test Guideline 414 Result: No teratogenic effects
Reproductive toxicity - Assessment	:	Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

STOT - single exposure

Not classified due to lack of data.

STOT - repeated exposure

Not classified due to lack of data.

Repeated dose toxicity

Components:

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Species	:	Rat, male and female
NOEL	:	1 mg/kg
LOAEL	:	10 mg/kg
Application Route	:	Skin contact
Exposure time	:	13 Weeks
Number of exposures	:	5 days/week for 13 weeks
Method	:	OECD Test Guideline 411

Aspiration toxicity

Not classified due to lack of data.

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

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Toxicity to fish	:	LL50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h Test Type: semi-static test Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): 7,2 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	IC50 (Selenastrum capricornutum (green algae)): 843,75 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201
Toxicity to microorganisms	:	IC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Method: OECD Test Guideline 209

12.2 Persistence and degradability

Components:

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Biodegradability	:	Test Type: aerobic Inoculum: activated sludge Concentration: 100 mg/l Result: Readily biodegradable. Biodegradation: 87 % Exposure time: 28 d Method: OECD Test Guideline 301F

12.3 Bioaccumulative potential

Components:

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Partition coefficient: n-octanol/water	:	log Pow: 3,77 (20 °C) Method: OECD Test Guideline 107

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. Toxic to aquatic life.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Dispose of contents and container in accordance with all local, regional, national and international regulations. Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: Transport information

14.1 UN number or ID number

ADN	:	Not regulated as dangerous goods
ADR	:	Not regulated as dangerous goods
RID	:	Not regulated as dangerous goods
IMDG	:	Not regulated as dangerous goods
IATA	:	Not regulated as dangerous goods

14.2 UN proper shipping name

ADN	:	Not regulated as dangerous goods
ADR	:	Not regulated as dangerous goods
RID	:	Not regulated as dangerous goods
IMDG	:	Not regulated as dangerous goods
IATA	:	Not regulated as dangerous goods

14.3 Transport hazard class(es)

ADN	:	Not regulated as dangerous goods
ADR	:	Not regulated as dangerous goods
RID	:	Not regulated as dangerous goods
IMDG	:	Not regulated as dangerous goods
IATA	:	Not regulated as dangerous goods

14.4 Packing group

ADN	:	Not regulated as dangerous goods
ADR	:	Not regulated as dangerous goods
RID	:	Not regulated as dangerous goods
IMDG	:	Not regulated as dangerous goods
IATA (Cargo)	:	Not regulated as dangerous goods
IATA (Passenger)	:	Not regulated as dangerous goods

14.5 Environmental hazards

Not regulated as dangerous goods

14.6 Special precautions for user

Remarks	:	Not classified as dangerous in the meaning of transport regulations.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - List of substances subject to authorisation	:	Not applicable

(Annex XIV)

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	This product does not contain substances of very high concern.
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries should be considered: Number on list 75, 3 If you intend to use this product as tattoo ink, please contact your vendor.
Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.		Not applicable
Water hazard class (Germany)	:	WGK 2 obviously hazardous to water Code Number: 2 004 Remarks: Not classified as H350 or H351 Classification according to AwSV §6(4)

Other regulations:

The product is subject to the supply restrictions of the Ordinance on the Prohibition of Chemicals.

Take note of Law on the protection of mothers at work, in education and in studies (Maternity Protection Act - MuSchG).

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

The components of this product are reported in the following inventories:

DSL	:	All components of this product are on the Canadian DSL
AIIC	:	On the inventory, or in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory

TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory

Inventories

AICS (Australia), AIIC (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

15.2 Chemical safety assessment

For further information see eSDS.

SECTION 16: Other information

Further information

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

The trademarks above are the property of Huntsman Corporation or an affiliate thereof.

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE.

Annex to the Safety Data Sheet (eSDS)

ES 1	Formulation or re-packing, Industrial
ES 2	Use at industrial site leading to inclusion into/onto article
ES 3	Professional use
ES 4	Consumer application of coatings, Consumer use
ES 5	Manufacture of the substance Industrial uses
ES 6	Formulation or repacking of adhesives Industrial uses
ES 7	End use industrial Use in adhesives/sealants at industrial sites - 1 Industrial uses
ES 8	End use industrial Use in adhesives/sealants at industrial sites - 2 Industrial uses
ES 9	Manufacture of electro isolators, engines and electronic components through casting and impregnation Industrial uses
ES 10	Industrial use of liquid paints as corrosion protection coatings Industrial uses
ES 11	Professional use flooring (spreading and rolling, no brushing) Professional uses
ES 12	Service life for plastic articles produced at Industrial Sites Industrial uses
ES 13	Service life for plastic articles used by professionals Professional uses

ES 1: Formulation or re-packing, Industrial

1.1. Title section

Exposure Scenario name	:	Formulation or re-packing, Industrial

Environment		
CS 1	**Formulation of preparations**	ERC2
Worker		
CS 2	**Use in closed batch process (synthesis or formulation)**	PROC3
CS 3	**Use in batch and other process (synthesis) where opportunity for exposure arises**	PROC4
CS 4	**Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**	PROC8b
CS 5	**Transfer of substance or preparation into small containers (dedicated filling line, including weighing)**	PROC9

1.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount per site	:	<= 220 kg
Annual amount per site	:	<= 10000 kg Worst case assumption
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP sludge treatment	:	Controlled application of sewage sludge to agricultural soil
STP effluent	:	2 000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d

1.2.2. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Vapour pressure	:	0,018 Pa
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Local exhaust ventilation Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes use at not more than 20°C above ambient temperature. 20 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	8,0 h

Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 100 %
Assumes a good basic standard of occupational hygiene is implemented
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Dermal - minimum efficiency of 90 %
Wear suitable respiratory protection. Dermal - minimum efficiency of 90 %
Use suitable eye protection.
Other conditions affecting workers exposure
Body parts exposed : Palms of both hands (480 cm2)
Indoor or outdoor use : Indoor use
Professional or industrial settings : Industrial use
Temperature : Covers use at ambient temperatures.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
For further specification, refer to section 8 of the SDS.

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

Product (article) characteristics
Physical form of product : Liquid substance
Amount used (or contained in articles), frequency and duration of use/exposure
Amount per Day :
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Inhalation - minimum efficiency of 0 %
Local exhaust ventilation Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 95 %
Assumes a good basic standard of occupational hygiene is implemented

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor use
Professional or industrial settings	:	Industrial use
Temperature	:	Assumes process temperature up to 40 °C
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Demonstrable and effective housekeeping practices are in place.		
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	8 h
Use frequency	:	Use frequency hours/day
Technical and organisational conditions and measures		
Local exhaust ventilation Provide a basic standard of general ventilation (1 to 3 air changes per hour). Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Dermal - minimum efficiency of 90 %		
Wear suitable respiratory protection. Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 90 %		
Use suitable eye protection.		

Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor use
Professional or industrial settings	:	Industrial use
Temperature	:	Covers use at ambient temperatures.
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Demonstrable and effective housekeeping practices are in place.		
Wear suitable coveralls to prevent exposure to the skin.		
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		

1.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	5E-3%	
Air	1 %	
Soil	0 %	

Protection Target	Exposure estimate	RCR
Freshwater	4.16E-5mg/L (EUSES v2.1)	< 0,01
Freshwater sediment	2,963mg/kg dry weight (EUSES v2.1)	< 0,01
Marine water	0.000214mg/L (EUSES v2.1)	< 0,01
Marine sediment	0,58mg/kg dry weight (EUSES v2.1)	< 0,01
Sewage treatment plant	0.000404mg/L (EUSES v2.1)	< 0,01
Man via environment - Inhalation	0.0000773mg/m³ (EUSES v2.1)	< 0,01
Agricultural soil	0,017mg/kg dry weight (EUSES v2.1)	< 0,01
Man via environment - Oral	0,00443mg/kg bw/day (EUSES v2.1)	< 0,01

1.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,449mg/m³	
inhalative	local	long-term	0,449mg/m³	
inhalative	local			
dermal	systemic	long-term	0,138mg/kg bw/day	0,138
dermal	local	long-term	0,04mg/cm2	
combined routes	systemic	long-term		0,263
dermal	local	short-term	0,04mg/cm2	

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	1,069mg/m³	0,297
inhalative	local	long-term	1,069mg/m³	
inhalative	local	short-term	4,275mg/m³	
dermal	systemic	long-term	0,686mg/m³	0,686
dermal	local	long-term	0,1mg/m³	
dermal	local	short-term	0,1mg/m³	
combined routes	systemic	long-term		0,983

Additional information on exposure estimation
Inhalation exposure is considered to be not relevant.

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,534mg/m³	0,148
inhalative	local	long-term	0,534mg/m³	
inhalative	local	short-term	2,138mg/m³	
dermal	systemic	long-term	0,685mg/m³	0,685
dermal	local	long-term	0,05mg/m³	
dermal	local	short-term	0,05mg/m³	0,834

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	1,069mg/m³	0,297

inhalative	local	long-term	1,069mg/m³	
inhalative	local	short-term	4,275mg/m³	
dermal	systemic	long-term	0,686mg/kg bw/day	
dermal	local	long-term	0,1mg/m³	
dermal	local	short-term	0,1mg/m³	
combined routes				0,983

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

ES 2: Use at industrial site leading to inclusion into/onto articleOther (PC0); Other (SU0).

2.1. Title section

Exposure Scenario name	:	Use at industrial site leading to inclusion into/onto article
Structured Short Title	:	Other (PC0); Other (SU0).

Environment		
CS 1	**Industrial use resulting in inclusion into or onto a matrix**	ERC5
Worker		
CS 2	**Industrial spraying**	PROC7
CS 3	**Roller application or brushing**	PROC10
CS 4	**Treatment of articles by dipping and pouring**	PROC13

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Industrial use resulting in inclusion into or onto a matrix (ERC5)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount per site	:	17,5 kg Worst case assumption
Annual amount per site	:	<= 3500 kg Worst case assumption
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP sludge treatment	:	Controlled application of sewage sludge to agricultural soil
STP effluent	:	2 000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.

Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %. 100 %		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers use up to 8 h
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Local exhaust ventilation Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 95 %		
Assumes a good basic standard of occupational hygiene is implemented		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection.		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands and upper wrists (1500 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	Assumes process temperature up to 40 °C
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
For further specification, refer to section 8 of the SDS.		
For further specification, refer to section 8 of the SDS.		

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %. 25 %		
Physical form of product	:	Low volatile liquid

Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers use up to 8 h
Technical and organisational conditions and measures		
Assumes a good basic standard of occupational hygiene is implemented		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection.		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
For further specification, refer to section 8 of the SDS.		

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

Product (article) characteristics		
Covers percentage substance in the product up to 5%. 5 %		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers use up to 8 h
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour). Inhalation - minimum efficiency of 0 %		
Local exhaust ventilation Dermal - minimum efficiency of 0 % Inhalation - minimum efficiency of 0 %		
Assumes a good basic standard of occupational hygiene is implemented		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.		
Use suitable eye protection.		

Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Professional use
Temperature	:	Assumes process temperature up to 40 °C
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
For further specification, refer to section 8 of the SDS.		

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: Industrial use resulting in inclusion into or onto a matrix (ERC5)

Release route	Release rate	Release estimation method
Water	0 %	
Air	1,07 %	
Soil	0 %	

Protection Target	Exposure estimate	RCR
Freshwater	2.06E-6mg/L (EUSES v2.1)	< 0,01
Freshwater sediment	0,00285mg/kg dry weight (EUSES v2.1)	< 0,01
Marine water	2E-7 mg/Lmg/L (EUSES v2.1)	< 0,01
Marine sediment	0,000277mg/kg dry weight (EUSES v2.1)	< 0,01
Sewage treatment plant	0.000404mg/L (EUSES v2.1)	< 0,01
Man via environment - Inhalation	2.96E-5 mg/m3mg/m³	< 0,01
Agricultural soil	0,000103mg/kg dry weight	< 0,01
Man via environment - Oral	0,000926mg/kg bw/day	< 0,01

2.3.2. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	106,9mg/m³	< 0,01
inhalative	local	long-term	106,9mg/m³	
inhalative	local	short-term	427,5mg/m³	

dermal	systemic	long-term	42,86mg/kg bw/day	< 0,01
dermal	local	long-term	2mg/cm2	
combined routes	systemic	long-term		< 0,01
dermal	local	short-term	2mg/cm2	

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,449mg/m³ (EASE v2.0)	0,125
inhalative	local	long-term	0,449mg/m³ (EASE v2.0)	
inhalative	local	short-term	1,795mg/m³ (EASE v2.0)	
dermal	systemic	long-term	0,823mg/kg bw/day (EASE v2.0)	0,823
dermal	local	long-term	0,06mg/cm2 (EASE v2.0)	
combined routes	systemic	long-term	(EASE v2.0)	0,948
dermal	local	short-term	0,06mg/cm2 (EASE v2.0)	

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	1,282mg/m³	0,356
inhalative	local	long-term	1,282mg/m³	
inhalative	local	short-term	5,13mg/m³	
dermal	systemic	long-term	0,411mg/kg bw/day	0,411
dermal	local	long-term	0,06mg/cm2	
combined routes	systemic	long-term		0,768
dermal	local	short-term	0,06mg/cm2	

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

ES 3: Professional useOther (PC0).

3.1. Title section

Exposure Scenario name	:	Professional use
Structured Short Title	:	Other (PC0).

Environment		
CS 1	**Wide dispersive indoor use resulting in inclusion into or onto a matrix**	ERC8c
Worker		
CS 2	**Professional use**	PROC4
CS 3	**Professional use**	PROC5
CS 4	**Professional use**	PROC10
CS 5	**Professional use**	PROC13

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Wide dispersive indoor use resulting in inclusion into or onto a matrix (ERC8c)

Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount per site	:	2 kg
Annual amount per site	:	50000 kg
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP sludge treatment	:	Controlled application of sewage sludge to agricultural soil
STP effluent	:	2 000 m3/d
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d

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

Product (article) characteristics		
Covers percentage substance in the product up to 5%.		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
times per day	:	<= 1 hours
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Assumes a good basic standard of occupational hygiene is implemented		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 90 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 95 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Professional use
Temperature	:	Assumes process temperature up to 40 °C
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
For further specification, refer to section 8 of the SDS.		

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

Product (article) characteristics		
Covers percentage substance in the product up to 5%.		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
times per day	:	<= 1 hours
Technical and organisational conditions and measures		

Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Assumes a good basic standard of occupational hygiene is implemented		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 80 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor use
Professional or industrial settings	:	Professional use
Temperature	:	Assumes process temperature up to 40 °C
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
For further specification, refer to section 8 of the SDS.		

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

Product (article) characteristics		
Covers percentage substance in the product up to 5%. 5 %		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount per site	:	4 hours
Technical and organisational conditions and measures		
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).		
Assumes a good basic standard of occupational hygiene is implemented		
Conditions and measures related to personal protection, hygiene and health evaluation		
Use suitable eye protection.		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 90 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
For further specification, refer to section 8 of the SDS.

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

Product (article) characteristics		
Covers percentage substance in the product up to 5%. 5 %		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Covers daily exposures up to 8 hours
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Assumes a good basic standard of occupational hygiene is implemented		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 90 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 95 %		
Use suitable eye protection.		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Professional use
Temperature	:	Assumes process temperature up to 40 °C
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
For further specification, refer to section 8 of the SDS.		

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure: Wide dispersive indoor use resulting in inclusion into or onto a matrix (ERC8c)

Release route	Release rate	Release estimation method
Water	0,6 kg/day	

Air	15 %	
Soil	0 %	

Protection Target	**Exposure estimate**	**RCR**
Freshwater	0,00214mg/L (EUSES v2.1)	0,02
Freshwater sediment	2,963mg/kg dry weight (EUSES v2.1)	0,096
Marine water	0.000214mg/L (EUSES v2.1)	0,02
Marine sediment	0,296mg/kg dry weight (EUSES v2.1)	0,096
Sewage treatment plant	0,022mg/L (EUSES v2.1)	< 0,01
Man via environment - Inhalation	0.00000438mg/m³	< 0,01
Agricultural soil	0,925mg/kg dry weight	0,75
Man via environment - Oral	0,111mg/kg bw/day	0,221

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

Exposure route	**Health effect**	**Exposure indicator**	**Exposure estimate**	**RCR**
inhalative	systemic	long-term	0,855mg/m³ (EASE v2.0)	0,238
inhalative	local	long-term	0,855mg/m³ (EASE v2.0)	
inhalative	local	short-term	17,1mg/m³ (EASE v2.0)	
dermal	systemic	long-term	0,274mg/kg bw/day (EASE v2.0)	0,274
dermal	local	long-term	0,04mg/cm2 (EASE v2.0)	
combined routes	systemic	long-term	(EASE v2.0)	0,512
dermal	local	short-term	0,04mg/cm2 (EASE v2.0)	

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

Exposure route	**Health effect**	**Exposure indicator**	**Exposure estimate**	**RCR**
inhalative	systemic	long-term	0,855mg/m³ (EASE v2.0)	0,238
inhalative	local	long-term	0,855mg/m³ (EASE v2.0)	
inhalative	local	short-term	17,1mg/m³ (EASE v2.0)	

dermal	systemic	long-term	0,548mg/kg bw/day (EASE v2.0)	0,548
dermal	local	long-term	0,08mg/cm2 (EASE v2.0)	
combined routes	systemic	long-term	(EASE v2.0)	0,786
dermal	local	short-term	0,08mg/cm2 (EASE v2.0)	

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0,962mg/m³	0,267
inhalative	local	long-term	0,962mg/m³	
inhalative	local	short-term	412mg/m³	
dermal	systemic	long-term	0,549mg/kg bw/day	0,549
dermal	local	long-term	0,04mg/cm2	
combined routes	systemic	long-term		0,816
dermal	local	short-term	0,04mg/cm2	

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	2,138mg/m³ (EASE v2.0)	0,594
inhalative	local	long-term	2,138mg/m³ (EASE v2.0)	
inhalative	local	short-term	8,55mg/m³ (EASE v2.0)	
dermal	systemic	long-term	0,274mg/kg bw/day (EASE v2.0)	0,274
dermal	local	long-term	0,04mg/cm2 (EASE v2.0)	
combined routes	systemic	long-term	(EASE v2.0)	0,868
dermal	local	short-term	0,04mg/cm2 (EASE v2.0)	

3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

ES 4: Consumer application of coatings, Consumer useAdhesives, sealants (PC1).

4.1. Title section

Exposure Scenario name	:	Consumer application of coatings, Consumer use
Structured Short Title	:	Adhesives, sealants (PC1).

Environment		
CS 1	**Consumer use**	ERC8c
Consumer		
CS 2	**Consumer use**	PC1

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Wide dispersive indoor use resulting in inclusion into or onto a matrix (ERC8c)

Product (article) characteristics		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Daily amount per site	:	0,0015 kg/day
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified.
Other conditions affecting environmental exposure		
Receiving surface water flow		

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

Glues, hobby use (PC1_1)

Product (article) characteristics		
Covers concentrations up to 2 %		
Physical form of product	:	Low volatile liquid
Amount used (or contained in articles), frequency and duration of use/exposure		
Amount used per event	:	1 g/event

Application rate	:	
Duration	:	Application duration
Use frequency	:	4 h/event
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: Wide dispersive indoor use resulting in inclusion into or onto a matrix (ERC8c)

Release route	Release rate	Release estimation method
Water	0.00045kg/day%	
Air	15 %	
Soil	0 %	

Protection Target	Exposure estimate	RCR
Freshwater	0.00000366mg/L (EUSES v2.1)	< 0,01
Freshwater sediment	0,00507mg/kg dry weight (EUSES v2.1)	< 0,01
Marine water	0.000000361mg/L (EUSES v2.1)	0,02
Marine sediment	0,000499mg/kg dry weight (EUSES v2.1)	0,096
Sewage treatment plant	0.0000164mg/L (EUSES v2.1)	< 0,01
Man via environment - Inhalation	0.00000111mg/m³	< 0,01
Agricultural soil	0,000732mg/kg dry weight	< 0,01
Man via environment - Oral	0,000123mg/kg bw/day	< 0,01

4.3.2. Consumer exposure: Adhesives, sealants (PC1)

Glues, hobby use (PC1_1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.000294	< 0,01
inhalative	local	long-term	0.000294	
dermal	systemic	long-term	0,119mg/kg bw/day	0,238
oral	systemic	long-term	0mg/kg bw/day	< 0,01

combined routes	systemic	long-term		0,238

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

ES 5: Manufacture of the substance.

5.1. Title section

Environment		
CS 1	**Manufacture of the substance**	ERC1
Worker		
CS 2	**Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions**	PROC1
CS 3	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 4	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 5	**Use as laboratory reagent**	PROC15

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Manufacture of the substance (ERC1)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	400 tonnes/year
Daily amount per site	:	20000 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 212 361,5 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 55 302,4 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 215 440,8 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine water.
Maximum allowable site tonnage	:	Daily amount per site

(MSafe)		56 104,3 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 999 999 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 16 796,1 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Emission days	:	220
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2 000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)

Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

5.2.3. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa

Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 120 min
Use frequency	:	5 days/week
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure: Manufacture of the substance (ERC1)

Release route	Release rate	Release estimation method
Water	0%	Environmental Release Category (ERC)
Air	0,01 %	Environmental Release Category (ERC)
Soil	0,01 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0 mg/Lmg/L	0
Freshwater	0,0000096mg/L	0.0000085617300713
Freshwater sediment	0,0000345mg/kg dry weight	0.0000328770840642
Marine water	0,0000009mg/L	0.0000084393579218
Marine sediment	0,0000034mg/kg dry weight	0.0000324071748326
Soil	0,000031mg/kg dry weight	0.0000015511073177
Secondary poisoning	1,9658806mg/kg bw/day	0,108

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,034mg/kg bw/day (EASY TRA v3.6)	0,046
inhalative	systemic	long-term	0,15mg/m³ (EASY TRA v3.6)	0,305

5.3.3. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,034mg/kg bw/day (EASY TRA v3.6)	0,046
inhalative	local	long-term	0,084mg/m³ (EASY TRA v3.6)	0,171
inhalative	systemic	long-term	0,084mg/m³ (EASY TRA v3.6)	0,171

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,411mg/kg bw/day (EASY TRA v3.6)	0,549
inhalative	local	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169
inhalative	systemic	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,02mg/kg bw/day (EASY TRA v3.6)	0,027
inhalative	local	long-term	0.00028 mg/m³mg/m³ (EASY TRA v3.6)	0.000571428560307
inhalative	systemic	long-term	0.00028 mg/m³mg/m³ (EASY TRA v3.6)	0.000571428560307

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

ES 6: Formulation or repacking of adhesives.

6.1. Title section

Environment		
CS 1	**Formulation into mixture**	ERC2
Worker		
CS 2	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 3	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 4	**Transfer of substance or mixture into small containers (dedicated filling line, including weighing)**	PROC9

6.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	40 tonnes/year
Daily amount per site	:	4000 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 467 195,3 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 121 665,3 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 473 969,7 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine water.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 123 429,5 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine

		sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 999 999 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 36 951,4 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Emission days	:	10
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2 000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

6.2.2. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		

Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week

Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

6.3. Exposure estimation and reference to its source

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

Release route	Release rate	Release estimation method
Water	0%	Environmental Release Category (ERC)
Air	2,5 %	Environmental Release Category (ERC)
Soil	0,01 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0 mg/Lmg/L	0
Freshwater	0,0000096mg/L	0.0000085617300713
Freshwater sediment	0,0000345mg/kg dry weight	0.0000328770840642
Marine water	0,0000009mg/L	0.0000084393579218
Marine sediment	0,0000034mg/kg dry weight	0.0000324071748326
Soil	0,000069mg/kg dry weight	0.0000034512365579
Secondary poisoning	3,4960772mg/kg bw/day	0,108

6.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure	Exposure	RCR

		indicator	estimate	
dermal	systemic	long-term	0,014mg/kg bw/day (EASY TRA v3.6)	0,018
inhalative	local	long-term	0,084mg/m³ (EASY TRA v3.6)	0,171
inhalative	systemic	long-term	0,084mg/m³ (EASY TRA v3.6)	0,171

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,274mg/kg bw/day (EASY TRA v3.6)	0,365
inhalative	local	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169
inhalative	systemic	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,137mg/kg bw/day (EASY TRA v3.6)	0,183
inhalative	local	long-term	0,18mg/m³ (EASY TRA v3.6)	0,367
inhalative	systemic	long-term	0,18mg/m³ (EASY TRA v3.6)	0,367

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

ES 7: End use industrial Use in adhesives/sealants at industrial sites - 1.

7.1. Title section

Environment		
CS 1	**Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)**	ERC6d
Worker		
CS 2	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 3	**Industrial spraying**	PROC7
CS 4	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 5	**Roller application or brushing**	PROC10
CS 6	**Treatment of articles by dipping and pouring**	PROC13

7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	90 tonnes/year
Daily amount per site	:	4500 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 525 594,7 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 136 873,5 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 533 215,9 tonnes/day

Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine water.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 138 858,1 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 999 999 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 41 570,4 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Emission days	:	20
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2 000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

7.2.2. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %		

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands and upper wrists (1500 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		

Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,025391 Pa
Temperature	:	25 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Inhalation - minimum efficiency of 70 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	25 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Inhalation - minimum efficiency of 70 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Release route	Release rate	Release estimation method
Water	0%	Environmental Release Category (ERC)
Air	1,07 %	Environmental Release Category (ERC)
Soil	0%	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR

Sewage treatment plant	0 mg/Lmg/L	0
Freshwater	0,0000096mg/L	0.0000085617300713
Freshwater sediment	0,0000345mg/kg dry weight	0.0000328770840642
Marine water	0,0000009mg/L	0.0000084393579218
Marine sediment	0,0000034mg/kg dry weight	0.0000324071748326
Soil	0,0000665mg/kg dry weight	0.0000033256923067
Secondary poisoning	3,3949749mg/kg bw/day	0,108

7.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,014mg/kg bw/day (EASY TRA v3.6)	0,018
inhalative	local	long-term	0,084mg/m³ (EASY TRA v3.6)	0,171
inhalative	systemic	long-term	0,084mg/m³ (EASY TRA v3.6)	0,171

7.3.3. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,034mg/kg bw/day (EASY TRA v3.6)	0,045
inhalative	local	long-term	0,15mg/m³ (EASY TRA v3.6)	0,306
inhalative	systemic	long-term	0,15mg/m³ (EASY TRA v3.6)	0,306

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,274mg/kg bw/day (EASY TRA v3.6)	0,365
inhalative	local	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169
inhalative	systemic	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169

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

Exposure route	Health effect	Exposure	Exposure	RCR

		indicator	estimate	
dermal	systemic	long-term	0,329mg/kg bw/day (EASY TRA v3.6)	0,439
inhalative	local	long-term	0,2mg/m³ (EASY TRA v3.6)	0,408
inhalative	systemic	long-term	0,2mg/m³ (EASY TRA v3.6)	0,408

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,165mg/kg bw/day (EASY TRA v3.6)	0,22
inhalative	local	long-term	0,2mg/m³ (EASY TRA v3.6)	0,408
inhalative	systemic	long-term	0,2mg/m³ (EASY TRA v3.6)	0,408

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

ES 8: End use industrial Use in adhesives/sealants at industrial sites - 2.

8.1. Title section

Environment		
CS 1	**Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)**	ERC6d
Worker		
CS 2	**Roller application or brushing**	PROC10

8.2. Conditions of use affecting exposure

8.2.1. Control of environmental exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	1 tonnes/year
Daily amount per site	:	50 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 5 405,6 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by wastewater treatment plant microbes.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 2 972,6 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 774 113,9 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 2 994,4 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine water.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 779 787 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine sediment.
Maximum allowable site tonnage	:	Daily amount per site

(MSafe)		40 137 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 461,9 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Emission days	:	20

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2 000 m3/d

Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,025391 Pa
Temperature	:	25 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Inhalation - minimum efficiency of 70 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm^2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use

Temperature	:	25 °C

8.3. Exposure estimation and reference to its source

8.3.1. Environmental release and exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Release route	Release rate	Release estimation method
Water	0,005 %	Environmental Release Category (ERC)
Air	35 %	Environmental Release Category (ERC)
Soil	0,025 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0,0000925mg/L	0.0000092495836138
Freshwater	0,0000188mg/L	0.0000168202868336
Freshwater sediment	0,0000678mg/kg dry weight	0.0000645899811848
Marine water	0,0000019mg/L	0.0000166979144645
Marine sediment	0,0000067mg/kg dry weight	0.0000641200715032
Soil	0,0000249mg/kg dry weight	0.0000012457346513
Secondary poisoning	1,7199601mg/kg bw/day	0,108

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,329mg/kg bw/day (EASY TRA v3.6)	0,439
inhalative	local	long-term	0,2mg/m³ (EASY TRA v3.6)	0,408
inhalative	systemic	long-term	0,2mg/m³ (EASY TRA v3.6)	0,408

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

ES 9: Manufacture of electro isolators, engines and electronic components through casting and impregnation.

9.1. Title section

Environment		
CS 1	**Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)**	ERC6d
Worker		
CS 2	**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition**	PROC3
CS 3	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 4	**Treatment of articles by dipping and pouring**	PROC13

9.2. Conditions of use affecting exposure

9.2.1. Control of environmental exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	1 tonnes/year
Daily amount per site	:	50 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 5 405,6 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by wastewater treatment plant microbes.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 2 972,6 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 774 113,9 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater sediment.
Maximum allowable site tonnage	:	Daily amount per site

(MSafe)		2 994,4 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine water.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 779 787 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 40 137 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 461,9 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Emission days	:	20

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2 000 m3/d

Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

9.2.2. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid substance
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		

Inhalation - minimum efficiency of 30 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	One hand face only (240 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics
Covers percentage substance in the product up to 25 %.

Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

9.3. Exposure estimation and reference to its source

9.3.1. Environmental release and exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Release route	Release rate	Release estimation method
Water	0,005 %	Environmental Release Category (ERC)
Air	35 %	Environmental Release Category (ERC)
Soil	0,025 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0,0000925mg/L	0.0000092495836138
Freshwater	0,0000188mg/L	0.0000168202868336
Freshwater sediment	0,0000678mg/kg dry weight	0.0000645899811848

Marine water	0,0000019mg/L	0.0000166979144645
Marine sediment	0,0000067mg/kg dry weight	0.0000641200715032
Soil	0,0000249mg/kg dry weight	0.0000012457346513
Secondary poisoning	1,7199601mg/kg bw/day	0,108

9.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,014mg/kg bw/day (EASY TRA v3.6)	0,018
inhalative	local	long-term	0,084mg/m³ (EASY TRA v3.6)	0,171
inhalative	systemic	long-term	0,084mg/m³ (EASY TRA v3.6)	0,171

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,274mg/kg bw/day (EASY TRA v3.6)	0,365
inhalative	local	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169
inhalative	systemic	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,165mg/kg bw/day (EASY TRA v3.6)	0,22
inhalative	local	long-term	0,001mg/m³ (EASY TRA v3.6)	0,002
inhalative	systemic	long-term	0,001mg/m³ (EASY TRA v3.6)	0,002

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

ES 10: Industrial use of liquid paints as corrosion protection coatings.

10.1. Title section

Environment		
CS 1	**Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)**	ERC6d
Worker		
CS 2	**Industrial spraying**	PROC7
CS 3	**Transfer of substance or mixture (charging/discharging) at dedicated facilities**	PROC8b
CS 4	**Roller application or brushing**	PROC10

10.2. Conditions of use affecting exposure

10.2.1. Control of environmental exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	4 tonnes/year
Daily amount per site	:	18 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 60 062,8 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by wastewater treatment plant microbes.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 17 338,8 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 4 515,3 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 17 524,7 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine water.

Maximum allowable site tonnage (MSafe)	:	Daily amount per site 4 563,7 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 411 794,1 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 1 847,6 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Emission days	:	20
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2 000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands and upper wrists (1500 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,025391 Pa
Temperature	:	25 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		

Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Inhalation - minimum efficiency of 70 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm^2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	25 °C

10.3. Exposure estimation and reference to its source

10.3.1. Environmental release and exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Release route	Release rate	Release estimation method
Water	0,005 %	Environmental Release Category (ERC)
Air	35 %	Environmental Release Category (ERC)
Soil	0,025 %	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0,0000333mg/L	0.000003329850101
Freshwater	0,0000129mg/L	0.0000115348105057
Freshwater sediment	0,0000465mg/kg dry weight	0.0000442937270276
Marine water	0,0000013mg/L	0.0000114124382772
Marine sediment	0,0000046mg/kg dry weight	0.000043823817634
Soil	0,0000097mg/kg dry weight	0.0000004856796352
Secondary poisoning	1,107879mg/kg bw/day	0,108

10.3.2. Worker exposure: Industrial spraying (PROC7)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,034mg/kg bw/day (EASY TRA v3.6)	0,045
inhalative	local	long-term	0,15mg/m^3 (EASY TRA v3.6)	0,306
inhalative	systemic	long-term	0,15mg/m^3 (EASY TRA v3.6)	0,306

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,274mg/kg bw/day (EASY TRA v3.6)	0,365
inhalative	local	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169
inhalative	systemic	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,329mg/kg bw/day (EASY TRA v3.6)	0,439
inhalative	local	long-term	0,2mg/m³ (EASY TRA v3.6)	0,408
inhalative	systemic	long-term	0,2mg/m³ (EASY TRA v3.6)	0,408

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

ES 11: Professional use flooring (spreading and rolling, no brushing).

11.1. Title section

Environment		
CS 1	**Widespread use leading to inclusion into/onto article (indoor)**	ERC8c
Worker		
CS 2	**Mixing or blending in batch processes**	PROC5
CS 3	**Transfer of substance or mixture (charging/discharging) at non dedicated-facilities**	PROC8a
CS 4	**Roller application or brushing**	PROC10
CS 5	**Treatment of articles by dipping and pouring**	PROC13

11.2. Conditions of use affecting exposure

11.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	100 tonnes/year
Daily amount per site	:	0,0109 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 905 810,2 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by wastewater treatment plant microbes.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 60 201,6 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 15 677,5 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 61 022 kg/day

Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine water.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 15 891,1 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 9 422,2 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 5,1 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Emission days	:	365
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2 000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 120 min
Use frequency	:	5 days/week
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		

Body parts exposed	:	Palms of both hands (480 cm2)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,025391 Pa
Temperature	:	25 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 240 min

Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Inhalation - minimum efficiency of 70 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Both hands (960 cm²)
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	25 °C

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

Product (article) characteristics		
Covers percentage substance in the product up to 25 %.		
Physical form of product	:	Liquid mixture
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %		
Other conditions affecting workers exposure		
Body parts exposed	:	Palms of both hands (480 cm2)

Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

11.3. Exposure estimation and reference to its source

11.3.1. Environmental release and exposure: Widespread use leading to inclusion into/onto article (indoor) (ERC8c)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0,000006mg/L	0.0000006049227683
Freshwater	0,0000102mg/L	0.0000091018396835
Freshwater sediment	0,0000367mg/kg dry weight	0.0000349511075359
Marine water	0,000001mg/L	0.0000089794675197
Marine sediment	0,0000036mg/kg dry weight	0.0000344811982749
Soil	0,0000012mg/kg dry weight	0.0000000581544117
Secondary poisoning	0,763588mg/kg bw/day	0,108

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,055mg/kg bw/day (EASY TRA v3.6)	0,073
inhalative	local	long-term	0,055mg/m³ (EASY TRA v3.6)	0,112
inhalative	systemic	long-term	0,055mg/m³ (EASY TRA v3.6)	0,112

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,274mg/kg bw/day (EASY TRA v3.6)	0,365
inhalative	local	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169
inhalative	systemic	long-term	0,083mg/m³ (EASY TRA v3.6)	0,169

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

Exposure route	Health effect	Exposure	Exposure	RCR

		indicator	estimate	
dermal	systemic	long-term	0,329mg/kg bw/day (EASY TRA v3.6)	0,439
inhalative	local	long-term	0,2mg/m³ (EASY TRA v3.6)	0,408
inhalative	systemic	long-term	0,2mg/m³ (EASY TRA v3.6)	0,408

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,055mg/kg bw/day (EASY TRA v3.6)	0,073
inhalative	local	long-term	0,001mg/m³ (EASY TRA v3.6)	0,002
inhalative	systemic	long-term	0,001mg/m³ (EASY TRA v3.6)	0,002

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

ES 12: Service life for plastic articles produced at Industrial Sites.

12.1. Title section

Environment		
CS 1	**Use of articles at industrial sites with low release**	ERC12c
Worker		
CS 2	**Low energy manipulation and handling of substances bound in/on materials and/or articles**	PROC21
CS 3	**High (mechanical) energy work-up of substances bound in/on materials and/or articles**	PROC24

12.2. Conditions of use affecting exposure

12.2.1. Control of environmental exposure: Use of articles at industrial sites with low release (ERC12c)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount per site	:	90 tonnes/year
Daily amount per site	:	4500 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 525 594,7 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 136 873,5 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 533 215,9 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine water.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 138 858,1 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 999 999 tonnes/day

Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 41 570,4 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Emission days	:	20
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2 000 m3/d
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

12.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Solid mixture Solid, low dustiness
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

12.2.3. Control of worker exposure: High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)

Product (article) characteristics

Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Solid mixture Solid, low dustiness
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Industrial use
Temperature	:	40 °C

12.3. Exposure estimation and reference to its source

12.3.1. Environmental release and exposure: Use of articles at industrial sites with low release (ERC12c)

Release route	Release rate	Release estimation method
Water	0%	Environmental Release Category (ERC)
Air	0%	Environmental Release Category (ERC)
Soil	0%	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0 mg/Lmg/L	0
Freshwater	0,0000096mg/L	0.0000085617300713
Freshwater sediment	0,0000345mg/kg dry weight	0.0000328770840642
Marine water	0,0000009mg/L	0.0000084393579218
Marine sediment	0,0000034mg/kg dry weight	0.0000324071748326
Soil	0,0000012mg/kg dry weight	0.0000000581486886
Secondary poisoning	0,7635834mg/kg bw/day	0,108

12.3.2. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,283mg/kg bw/day (EASY TRA v3.6)	0,377
inhalative	systemic	long-term	0,1mg/m³ (EASY TRA v3.6)	0,204

12.3.3. Worker exposure: High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,283mg/kg bw/day (EASY TRA v3.6)	0,377
inhalative	systemic	long-term	0,1mg/m³ (EASY TRA v3.6)	0,204

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

ES 13: Service life for plastic articles used by professionals.

13.1. Title section

Environment		
CS 1	**Widespread use of articles with low release (outdoor)**	ERC10a

CS 2	**Widespread use of articles with low release (indoor)**	ERC11a
Worker		
CS 3	**Low energy manipulation and handling of substances bound in/on materials and/or articles**	PROC21

CS 4	**High (mechanical) energy work-up of substances bound in/on materials and/or articles**	PROC24

13.2. Conditions of use affecting exposure

13.2.1. Control of environmental exposure: Widespread use of articles with low release (outdoor) (ERC10a)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	100 tonnes/year
Daily amount per site	:	0,0109 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 424 598,5 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by wastewater treatment plant microbes.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 56 408 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 14 689,6 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 57 127,7 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine water.

Maximum allowable site tonnage (MSafe)	:	Daily amount per site 14 877 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 9 421,2 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 5,1 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Emission days	:	365

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2 000 m3/d

Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

13.2.2. Control of environmental exposure: Widespread use of articles with low release (indoor) (ERC11a)

Amount used (or contained in articles), frequency and duration of use/exposure		
Annual amount used in the EU	:	100 tonnes/year
Daily amount per site	:	0,0109 kg/day
Fraction of EU tonnage used in region:	:	1
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 27 174,3 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by wastewater treatment plant microbes.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 63 865,1 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 16 631,5 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by freshwater sediment.

Maximum allowable site tonnage (MSafe)	:	Daily amount per site 64 789,1 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine water.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 16 872,2 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by marine sediment.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 9 423,1 tonnes/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by soil.
Maximum allowable site tonnage (MSafe)	:	Daily amount per site 5,1 kg/day
Critical compartment for Msafe	:	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Emission days	:	365

Conditions and measures related to sewage treatment plant		
STP type	:	Municipal sewage treatment plant
STP effluent	:	2 000 m3/d

Other conditions affecting environmental exposure		
Receiving surface water flow	:	18 000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

13.2.3. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Solid mixture Solid, low dustiness
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Other conditions affecting workers exposure		

Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Professional use
Temperature	:	40 °C

13.2.4. Control of worker exposure: High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)

Product (article) characteristics		
Covers percentage substance in the product up to 1 %.		
Physical form of product	:	Solid mixture Solid, low dustiness
Vapour pressure	:	0,066726 Pa
Temperature	:	40 °C
Amount used (or contained in articles), frequency and duration of use/exposure		
Duration	:	Frequency and duration of use 480 min
Use frequency	:	5 days/week
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor
Professional or industrial settings	:	Professional use
Temperature	:	40 °C

13.3. Exposure estimation and reference to its source

13.3.1. Environmental release and exposure: Widespread use of articles with low release (outdoor) (ERC10a)

Release route	**Release rate**	**Release estimation method**
Water	3,2 %	Environmental Release Category (ERC)
Air	0,05 %	Environmental Release Category (ERC)
Soil	3,2 %	Environmental Release Category (ERC)

Protection Target	**Exposure estimate**	**RCR**
Sewage treatment plant	0,0000129mg/L	0.0000012905019058
Freshwater	0,0000109mg/L	0.0000097139639108

Freshwater sediment	0,0000392mg/kg dry weight	0.0000373016674704
Marine water	0,0000011mg/L	0.0000095915917307
Marine sediment	0,0000039mg/kg dry weight	0.0000368317581761
Soil	0,0000012mg/kg dry weight	0.0000000581608979
Secondary poisoning	0,7635932mg/kg bw/day	0,108

13.3.2. Environmental release and exposure: Widespread use of articles with low release (indoor) (ERC11a)

Release route	Release rate	Release estimation method
Water	0,05 %	Environmental Release Category (ERC)
Air	0,05 %	Environmental Release Category (ERC)
Soil	0%	Environmental Release Category (ERC)

Protection Target	Exposure estimate	RCR
Sewage treatment plant	0,0000002mg/L	0.0000000201640923
Freshwater	0,0000096mg/L	0.000008579733725
Freshwater sediment	0,0000346mg/kg dry weight	0.0000329462181799
Marine water	0,0000009mg/L	0.0000084573615751
Marine sediment	0,0000034mg/kg dry weight	0.0000324763089473
Soil	0,0000012mg/kg dry weight	0.0000000581488794
Secondary poisoning	0,7635836mg/kg bw/day	0,108

13.3.3. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,283mg/kg bw/day (EASY TRA v3.6)	0,377
inhalative	systemic	long-term	0,3mg/m³ (EASY TRA v3.6)	0,612

13.3.4. Worker exposure: High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
dermal	systemic	long-term	0,283mg/kg bw/day (EASY TRA v3.6)	0,377

inhalative	systemic	long-term	0,3mg/m³ (EASY TRA v3.6)	0,612

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