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

1.1. Product identifier

Product name:
Undecanedioic acid, DC11P

Reach Substance name	Undecanedioic acid, DC11P
Additional identification:	HOOC(CH2)9COOH
REACH Registration Number	01-2119983505-29-0000
CAS	1852-04-6
EINECS/ELINCS	217-440-6

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

Identified uses

PROC 1: Use in closed process, no likelihood of exposure
PROC 2 Use in closed, continuous process with occasional controlled exposure.
PROC 3 Use in closed batch process (synthesis or formulation)
PROC 4 Use in batch and other process (synthesis) where opportunity for exposure arises
PROC 5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC 7 Spraying in industrial settings and applications
PROC 8a Transfer of substance or preparation (charging/discharging) from/to.
PROC 8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
PROC 9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC 14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation.
PROC 15 Use as laboratory reagent
PROC 17 Lubrication at high energy conditions and in partly open process
PROC 18 Greasing at high energy conditions

Uses advised against:
Not available.

1.3. Details of the supplier of the safety data sheet

Supplier
SysKem Chemie GmbH
Brucknerweg 26
D-42289 Wuppertal

Telephone	+49 (0) 202/30999510
Email	info@syskem.de

1.4. Emergency telephone number

Vergiftungs-Informations-Zentrale Freiburg, Tel. +49 761 19240.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]
Eye Irrit. 2; H319 Causes serious eye irritation.

The most important adverse effects
The most important adverse physicochemical effects
Eye Irritation

The most important adverse human health effects
Causes serious eye irritation.

2.2. Label elements

Hazard pictograms

Signal word
Warning.

Hazard Statement:
H319: Causes serious eye irritation.

Precautionary Statement:
P264 Wash thoroughly after handling.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313: If eye irritation persists: Get medical advice/attention.

2.3. Other hazards

Not PBT/ vPvB based on ready biodegradability.

SECTION 3: Composition/information on ingredients

3.1. Substance

Substance/Mixture: Substance

Ingredient(s):

Chemical Name	REACH Registration No.	CAS No.	EC No.	Concentration
Undecanedioic acid	01-2119983505-29-0000	1852-04-6	217-440-6	97%

3.2 Mixtures

Not applicable. The product is not a mixture.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information:
In all cases of doubt, or when symptoms persist, seek medical attention.

In case of inhalation:
Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

In case of skin contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention in case of skin irritation or rash.

In case of eyes contact:
Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses if present and easy to do. Continue rinsing. Get medical aid immediately if eye irritation persists.

In case of ingestion:
Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Rinse mouth and drink 2-4 cupfuls of milk or water. Get medical aid.

4.2 Most important symptoms and effects, both acute and delayed

Eyes swelling with eyelid more than half-closed, discharge with moistening of the eyelids and large areas around the eye, generalised red coloration, corneal opacity.

4.3 Indication of any immediate medical attention and special treatment needed

Seek medical attention immediately in case of inhalation or if eye irritation persists.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:
Water spray, dry chemical foam, or chemical foam.

Unsuitable extinguishing media
Not available.

5.2 Special hazards arising from the substance or mixture

Can be released in case of fire:
Carbon monoxide and carbon dioxide.

5.3 Advice for firefighters

As in any fire, wear a self-contained breathing apparatus in pressure-demand, NIOSH approved respirator with a green cartridge (US), or appropriate CEN approved respirators (Europe), and full protective gear.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Remove ignition sources. Provide adequate ventilation. Avoid inhalation of vapor or dust. Avoid skin and eye contact. Wear protective gloves/protective clothing/eye protection/face protection.

For emergency responders
Wear a NIOSH approved respirator with a green cartridge (US), or appropriate CEN approved respirators (Europe) if mist, vapor or dust is generated.

6.2 Environmental precautions:

Avoid disposing into drainage/sewer system or directly into the aquatic environment. Keeping away from drains, surface- and ground-water and soil.

6.3 Methods and material for containment and cleaning up:

Remove source of heat, sparks, flame, impact, friction or electricity. Avoid raising dust. Dike spill.
Recover undamaged and minimally contaminated material for reuse and reclamation. Shovel or sweep up. Place in suitable containers for disposal or reclamation.

6.4 Reference to other sections

See Section 7 for information on safe handling.
See section 8 for information on personal protection equipment.
See Section 13 for information on disposal.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures:
Chemically resistant gloves conforming to EN374 (effectiveness 80%) have to be worn when handling the substance to insure a safe use for workers. Furthermore protective goggles have always to be worn because of the irritating properties of the substance to eyes.
Use in a basic general ventilation (1-3 air changes per hour) area. Minimize dust generation and accumulation. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. If dust formation is possible during filling/transfer/charging or discharging operations LEV (effectiveness 90%) or half mask respirators with dust filters (effectiveness 90%) is required.

Advice on general occupational hygiene:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse.

7.2 Conditions for safe storage, including any incompatibilities

Do not mix with strong oxidants. Store in a cool and well ventilated place. Keep container tightly closed.

7.3 Specific end use(s)

Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits:
None listed.

Additional exposure limits under the conditions of use:
Not available.

DNEL/DMEL and PNEC-Values

DNEL (Derived No Effect Level) for workers

Exposure pattern	Route	DNEL value	Most sensitive endpoint
Long-term - systemic effects	dermal	10 mg/kg bw/day	Repeated dose toxicity
Long-term - systemic effects	inhalation	70 mg/m3	Repeated dose toxicity
Long-term - systemic effects	Eyes	High hazard (no threshold derived)	

DNEL (Derived No Effect Level) for the general population

Exposure pattern	Route	DNEL value	Most sensitive endpoint
Long-term - systemic effects	dermal	5 mg/kg bw/day	Repeated dose toxicity
Long-term - systemic effects	inhalation	17,4 mg/m3	Repeated dose toxicity
Long-term - systemic effects	oral	5 mg/kg bw/day	Repeated dose toxicity
Long-term - systemic effects	Eyes	High hazard (no threshold derived)	

PNEC(Predicted No Effect Concentration) values

Environment compartment		PNEC value
Aquatic compartment	- aqua (freshwater)	0,0387 mg/l
Aquatic compartment	- aqua (marine water)	0,00387 mg/l
Aquatic compartment	- aqua (intermittent releases)	0,387 mg/l
Aquatic compartment	- sediment (freshwater)	0,0639 mg/kg dw
Aquatic compartment	- sediment (marine water)	0,00639 mg/kg dw
Terrestrial compartment	- soil	0,047 mg/kg dw
Sewage treatment plant		10 mg/l
Oral (secondary poisoning)		no significant potential for bioaccumulation

8.2 Exposure controls

Appropriate engineering controls:
Provide sufficient ventilation to keep employee exposure below recommended limits.

Individual protection measures, such as personal protective equipment:
Eye/face protection
Wear chemical safety goggles to prevent eye exposure.

Hand protection
Chemically resistant gloves conforming to EN374 (effectiveness 80%) have to be worn.

Body protection
Wear appropriate protective clothing to prevent skin exposure.

Respiratory protection
Use in a basic general ventilation (1-3 air changes per hour) area.

Thermal hazards
Wear suitable protective clothing to prevent heat.

Environmental exposure controls:
Avoid discharge into the environment.
According to local regulations, federal and official regulations.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance:	Solid
Colour:	White
Odour:	Odorless
Odour threshold:	N/A
pH:	5
Granulometry (D50)	17.12μm
Melting point/range (°C):	110.12ºC
Boiling point/range (°C) :	Decomp. 259.2°C without boiling
Flash point (°C) :	Decomp. 259.2°C without flash
Evaporation rate:	Not available
Flammability (solid, gas);	Conclusive but not sufficient for classification
Ignition temperature (°C) :	Not available
Upper/lower flammability/explosive limits:	Not available
Vapour pressure (20°C):	＜10Pa
Vapour density:	Not available
Relative Density (20°C):	1.184 g/cm3
Bulk density (kg/m3) :	Not available
Water solubility (20°C):	324.1mg/L
n-Octanol/Water (log Po/w) (25°C):	2.8
Auto-ignition temperature:	＞400°C
Decomposition temperature:	259.2°C
Viscosity, dynamic (mPa s) :	N/A
Explosive properties:	Conclusive but not sufficient for classification
Oxidising properties:	Conclusive but not sufficient for classification

9.2 Other information

Dissociation constant in water(pKa)	4.95

SECTION 10: Stability and reactivity

10.1 Reactivity:

Stable under normal conditions.

10.2 Chemical stability:

Stable under normal conditions.

10.3 Possibility of hazardous reactions:

Under normal conditions, not hazardous reactions will occur.

10.4 Conditions to avoid:

Incompatible materials.

10.5 Incompatible materials:

Strong oxidizing agents, reducing agents.

10.6 Hazardous decomposition products:

Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:
LD50 (Oral, Rat): > 5000 mg/kg bw (No adverse effect observed)
LD50 (Dermal, Rabbit): > 6000 mg/kg bw (Adverse effect observed)
LD50 (Inhalation, Rat): No study available.

Skin corrosion/Irritation:
Conclusive but not sufficient for classification.

Serious eye damage/irritation:
Causes serious eye irritation.

Respiratory or skin sensitization:
Conclusive but not sufficient for classification.

Germ cell mutagenicity:
Conclusive but not sufficient for classification.

Carcinogenicity:
Conclusive but not sufficient for classification.

Reproductive toxicity:
Conclusive but not sufficient for classification.

STOT- single exposure:
Conclusive but not sufficient for classification.

STOT-repeated exposure:
Conclusive but not sufficient for classification.

Aspiration hazard:
Conclusive but not sufficient for classification.

SECTION 12: Ecological information

12.1 Toxicity

Not available.

12.2 Persistence and degradability

Readily biogradable.

12.3 Bioaccumulative potential

N/A.

12.4 Mobility in soil

N/A.

12.5 Results of PBT and vPvB assessment

N/A.

12.6 Other adverse effects

N/A.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Low risk. Avoid discharge into the environment. According to local regulations, federal and official regulations.

Product / Packaging disposal
If empty container retains product residues, all label precautions must be observed. Return for reuse or dispose according to national or local regulations.

SECTION 14: Transport information

14.1 UN number

See SECTION14.2 in accordance with UN shipping name

14.2 UN proper shipping name

Transport by land according to ADR/RID
NO DANGEROUS GOODS

Inland navigation (ADN)
NO DANGEROUS GOODS

Marine transport in accordance with IMDG
NOT CLASSIFIED AS "DANGEROUS GOODS"

Air transport in accordance with IATA
NOT CLASSIFIED AS "DANGEROUS GOODS"

14.3 Transport hazard class(es)

See SECTION14.2 in accordance with UN shipping name

14.4 Packing group

See SECTION14.2 in accordance with UN shipping name

14.5 Environmental hazards

See SECTION14.2 in accordance with UN shipping name

14.6 Special precautions for user

Relevant information under SECTION 6 to 8.

14.7 Transport in bulk acaccording to Annex II of MARPOL73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

Relevant information regarding authorization:
Not applicable.

Relevant information regarding restriction:
Not applicable.

Other EU regulations:
Employment restrictions concerning young person must be observed. For use only by technically qualified individuals.

Other National regulations:
Not applicable

15.2. Chemical Safety Assessment

Chemical Safety Assessment has been carried out? YES ☒ NO ☐

SECTION 16: Other information

Indication of changes
Section 1

Relevant hazard-statements (number and full text):
H319 Causes serious eye irritation.

Training instructions:
Not applicable.

Further information:
This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

Notice to reader
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgment of suitability of this information to ensure proper use and protect the health and safety of employees.
This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Annex to extended safety data sheet (eSDS)

Overview of exposure scenarios:

Identifiers	Market-sector	Titles of exposure scenarios and the related contributing scenarios
ES1- F1. Formulation	PC 4, PC16, PC24, PC25	Formulation of preparations - Formulation of preparations (ERC 2) - Use in closed process, no likelihood of exposure (PROC 1) - Use in closed, continuous process with occasional controlled exposure (PROC 2) - Use in closed batch process (synthesis or formulation) (PROC 3) - Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4) - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5) - Industrial spraying (PROC 7) - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b) - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9) - Production of preparations or articles by tabletting, compression,extrusion, pelletisation (PROC 14) - Use as laboratory reagent (PROC 15) - Lubrication at high energy conditions and in partly open process (PROC 17) - Greasing at high energy conditions (PROC 18)
ES2 - IW1. Intermediates	PC32	Industrial use resulting in manufacture of another substance (use of intermediates) • Industrial use resulting in manufacture of another substance (use of intermediates) (ERC 6a) • Use in closed process, no likelihood of exposure (PROC 1) • Use in closed, continuous process with occasional controlled exposure (PROC 2) • Use in closed batch process (synthesis or formulation) (PROC 3) • Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4) • Industrial spraying (PROC 7) • Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC 8a) • Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b) • Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9) • Production of preparations or articles by tabletting, compression, extrusion, pelletisation (PROC 14)

ES3 - IW2 Monomers	PC32	Industrial use of monomers for manufacture of thermoplastics • Industrial use of monomers for manufacture of thermoplastics (ERC 6c) • Use in closed process, no likelihood of exposure (PROC 1) • Use in closed, continuous process with occasional controlled exposure (PROC 2) • Use in closed batch process (synthesis or formulation) (PROC 3) • Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4) • Industrial spraying (PROC 7) • Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC 8a) • - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b) • - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9) • - Production of preparations or articles by tabletting, compression, extrusion, pelletisation (PROC 14)

Manufacture: M-#, Formulation: F-#, Industrial end use at site: IW-#, Professional end use: PW-#, Consumer end use: C-#, Service life (by workers in industrial site): SL-IW-#, Service life (by professional workers): SL-PW-#, Service life (by consumers): SL-C-#.)

Overall worker exposure assessment and risk assessment

Process category	Use scenario	Exposure Scenario No.	Duration activity (hours)	LEV (Y/N)	Exposure concentration		Risk characterisation (RCR)		Combined routes RCR
					Inhalation	Dermal	Inhalation	Dermal	
					mg/m3	mg/kg bw/d			
PROC1	Use in a closed process with no likelihood of exposure	ES1-F1 ES2 - IW1 ES3– IW2	> 4 h	No	0,01	0,034	< 0,01	< 0,01	< 0,01
PROC2	Use in closed, continuous process with occasional controlled exposure	ES1-F1 ES2 - IW1 ES3– IW2	> 4 h	Yes	1	1,37	0,014	0,137	0,151
PROC3	Use in closed batch process (synthesis or formulation)	ES1-F1 ES2 - IW1 ES3– IW2	> 4 h	No	1	0,69	0,014	0,069	0,083
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises	ES1-F1 ES2 - IW1 ES3– IW2	> 4 h	Yes	25	1,372	0,357	0,137	0,494
PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	ES1-F1	> 4 h	Yes	25	2,742	0,375	0,274	0,631
PROC7	Spraying in industrial settings and applications	ES1-F1 ES2 - IW1 ES3– IW2	> 4 h	Yes	5	8,572	0,071	0,857	0,929
PROC8a	Transfer of substance or preparation (charging/ discharging) from/to vessels/ large containers at non-dedicated facilities	ES1-F1 ES2 - IW1 ES3– IW2	> 4 h	Yes	50	2,742	0,714	0,274	0,988
PROC8b	Transfer of substance or preparation (charging/ discharging) from/to vessels/ large containers at dedicated facilities	ES1-F1 ES2 - IW1 ES3– IW2	> 4 h	Yes	25	2,742	0,357	0,274	0,631
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing	ES1-F1 ES2 - IW1 ES3– IW2	> 4 h	Yes	20	6,86	0,286	0,686	0,972
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation	ES1-F1 ES2 - IW1 ES3– IW2	> 4 h	Yes	10	3,43	0,143	0,343	0,486
PROC15	Use as laboratory reagent	ES1-F1	> 4 h	Yes	5	0,34	0,071	0,034	0,105
PROC17	Lubrication at high energy conditions and in partly open process	ES1-F1	> 4 h	No	5	5,486	0,071	0,549	0,62
PROC18	Greasing at high energy conditions	ES1-F1	> 4 h	Yes	50	2,742	0,714	0,274	0,988

Conclusion on risk characterisation

- No short term hazard was identified for Undecanedioic Acid therefore no DNELshort-term was derived.
- Exposure and risk assessment is presented for long term exposure (duration: > 4h) is considered to be protective also for short term exposure.
- With the exception of the irritating properties on eyes, no adverse local effects are known by Undecanedioic Acid, therefore no DNELlocal was derived. Undecanedioic Acid is irritating to the eyes(Eye Dam. 1 ; Hazard statement: H318: Causes serious eye damage) and hence protective goggles have to be worn.

Risk Characterisation related to combined exposure

1 Human

1.1 Worker

A systemic DNEL in mg/kg bw/day for long term exposure was derived from the oral value, and a systemic DNEL long term in mg/m 3 for the inhalation route was also derived from the oral value. Based on the above judgement, all workers RCR are lower than 1 based on the precautionary equipment and statements employed.

1.2 Customer

Not applicable

2 Environment

2.1

The total releases covered are presented in the table below.

Total releases to the environment from all the exposure scenarios		
Release route	**Total releases per year (kg/year)**	
Water	28.22	
Air	97,92	
Soil	140,88	
Predicted regional exposure concentrations (Regional PEC) in the environment		
Protection target	**Regional PEC**	**RCR**
Freshwater	1.185E-7 mg/L	< 0,01
Sediment (freshwater)	8.179E-7 mg/kg dw	< 0,01
Marine water	1.034E-8 mg/L	< 0,01
Sediment (marine water)	7.094E-8 mg/kg dw	< 0,01
Air	8.483E-9 mg/m3	
Agricultural soil	3.832E-9 mg/kg dw	< 0,01
Regional exposure to man via the environment		
Route	**Regional exposure**	**RCR**
Inhalation	8.483E-9 mg/m3	< 0,01
Oral	1.296E-6 mg/kg bw/day	< 0,01
Combined routes		< 0,01

Exposure Scenario 1: Formulation

1 Exposure Scenario

1.1 Exposure Scenario Title
Formulation of preparations

1.2 Exposure Scenario Categories

Exposure scenario 1	Data field	Explanation
Market Sector categories	PC 4 PC 16 PC 24 PC 25	Anti-Freeze and De-icing products; Heat Transfer Fluids; Lubricants, Greases, Release Products; Metal Working Fluids
Process categories	PROC1 PROC 2 PROC3 PROC4 PROC5 PROC 7 PROC 8a PROC 8b PROC 9 PROC 14 PROC 15 PROC 17 PROC18	Use in closed process, no likelihood of exposure Use in closed, continuous process with occasional controlled exposure Use in closed batch process (synthesis or formulation) Use in batch and other process (synthesis) where opportunity for exposure arises Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) Industrial spraying Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Transfer of substance or preparation into small containers (dedicated filling line, including weighing) Production of preparations or articles by tabletting, compression, extrusion, pelletisation Use as laboratory reagent Lubrication at high energy conditions and in partly open process Greasing at high energy conditions

2 Operational conditions and risk management measures

2.1 Exposure and risks for workers

2.1.1 Product characteristics

Product characteristics	Data field
Physical form of product	solid at 20°C and 101.3kPa
Dustiness of material	High
Concentration of substance in mixture	Substance as such
Amount used, frequency and duration of use/exposure	Duration of activity: < 8 hours
Human factors not influenced by risk management	None identified.

2.1.2 Contributing scenarios and risk management measures

2.1.2.1 Technical and organisational conditions and measures

PROC #	Technical and organisational conditions and measures
PROC1	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Closed system (minimal contact during routine operations) • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC3	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Closed batch process with occasional controlled exposure • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC7	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: No • Local exhaust ventilation: Yes [Effectiveness Inhal: 95%] Local exhaust ventilation (LEV, effectiveness 95%) has to be used to insure safe use for workers. • Local exhaust ventilation (for dermal): no [Effectiveness Dermal: 0%] • Occupational Health and Safety Management System: Advanced
PROC2	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Closed continuous process with occasional controlled exposure • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC4 PROC8b PROC9	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Semi-closed process with occasional controlled exposure • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC 5 PROC 8a PROC14 PROC15 PROC17 PROC18	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: No • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced

2.1.2.2 Conditions and measures related to personal protection, hygiene and health evaluation

PROC #	Conditions and measures related to personal protection, hygiene and health evaluation
PROC1 PROC2 PROC3 PROC9 PROC14 PROC15	• Dermal Protection: No [Effectiveness Dermal: 0%] No gloves are required regarding the low level of risk for dermal exposure (RCR <1). However, we recommend wearing gloves when the hands may come into direct contact with the substance. Furthermore protective goggles have always to be worn because of the irritating properties of the substance to eyes. • Respiratory Protection: No [Effectiveness Inhal: 0%]
PROC4 PROC5 PROC7 PROC8a PROC8b PROC14 PROC17 PROC18	• Dermal Protection: Yes (chemically resistant gloves conforming to EN374) [Effectiveness Dermal: 80%] Chemically resistant gloves conforming to EN374 (effectiveness 80%) have to be worn when handling the substance to insure a safe use for workers. Furthermore protective goggles have always to be worn because of the irritating properties of the substance to eyes . • Respiratory Protection:No [Effectiveness Inhal: 0%]

2.1.2.3 Other conditions affecting workers exposure

PROC #	Other conditions affecting workers exposure
PROC1 PROC3 PROC15	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: One hand face only (240 cm 2)
PROC2 PROC4 PROC5 PROC9 PROC14	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: Two hands face (480 cm 2)
PROC7	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: Two hands and upper wrists (1500 cm 2)
PROC8a PROC8b PROC17 PROC18	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: Two hands (960 cm 2)

2.2 Exposure and risks for environment

2.2.1 Product characteristics

Product characteristics	Data field
Physical form of product	• Susceptibility to hydrolysis is unlikely based on its structure. • Surface activity is not a desired property of the substance based on its structure
Operational conditions	Readily biodegradable
Dustiness of material	High
Concentration of substance in mixture	Substance as such
Amount used, frequency and duration of use/exposure	• Daily use at site: <= 2 tonnes/day • Annual use at a site: <= 200 tonnes/year
Environmental factors not influenced by risk management	None identified.

2.2.2 Contributing scenarios and risk management measures

Conditions and measures related to sewage treatment plant
• Municipal STP: Yes [Effectiveness Water: 87.38%] • Discharge rate of STP: >= 2E3 m 3 /d • Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste (including article waste)
• Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient).
Other conditions affecting environmental exposure
• Receiving surface water flow rate: >= 1.8E4 m3/d

Local releases to the environment	
Water release factor	Initial release factor: 0.002% Final release factor: 0.002% Local release rate: 0.026 kg/day
Air release factor	Initial release factor: 5E-4% Final release factor: 5E-4% Local release rate: 0.006 kg/day
Soil release factor	Final release factor: 0.01%
Explanation/ Justification: According to TGD II,The substance is covered by Industrial category IC 8 "Metal extraction, refining and processing industry", formulated with main function "metal working fluids, heating transferring agents, lubricants and additives" and with vapour pressure between 10 and 100 Pa.	

2.3 Exposure Estimation

2.3.1 Health

PROC#	**Inhalation exposure – longterm (mg/m3)**	**RCR Inhalation**	**Dermal exposure – long term (mg/kg BW/day)**	**RCR dermal**
PROC1	0,01	< 0,01	0,034	<0,01
PROC2	1	0,014	1,37	0,137
PROC3	1	0,014	0,69	0,069
PROC4	25	0,357	1,372	0,137
PROC5	25	0,375	2,742	0,274
PROC7	5	0,071	8,572	0,857
PROC8a	50	0,714	2,742	0,274
PROC8b	25	0,357	2,742	0,274
PROC9	20	0,286	6,86	0,686
PROC14	10	0,143	3,43	0,343
PROC15	5	0,071	0,34	0,034
PROC17	5	0,071	5,486	0,549
PROC19	50	0,714	2,742	0,274

2.3.2 Environment

Exposure concentrations and risks for the environment		
Protection target	**Exposure concentration**	**Risk characterisation**
Freshwater	**Local PEC:** 1.616E-4 mg/L	RCR < 0.01
Sediment (freshwater)	**Local PEC:** 0.001 mg/kg dw	RCR < 0.019
Marine water	**Local PEC:** 1.616E-5 mg/L	RCR < 0.01
Sediment (marine water)	**Local PEC:** 1.228E-4 mg/kg dw	RCR < 0.019
Sewage treatment plant	**Local PEC:** 0,002 mg/L	RCR < 0.01
Agricultural soil	**Local PEC:** 1.443E-4 mg/kg dw	RCR < 0.01
Man via Environment - Inhalation	**Local PEC:** 4.959E-7 mg/m3	RCR < 0.01
Man via Environment - Oral	**Exposure via food consumption:** 9.046E-5 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

Contribution to oral intake for man via the environment from local contribution		
Type of food	**Estimated daily dose**	**Concentration in food**
Drinking water	1.378E-6 mg/kg bw/day	5,207E-5 mg/l
Fish	3.488E-6 mg/kg bw/day	0,002 mg/kg ww
Leaf crops	8.358E-5 mg/kg bw/day	2,337 mg/kg ww
Root crops	1.974E-6 mg/kg bw/day	0,007 mg/kg ww
Meat	2.12E-8 mg/kg bw/day	0,063 mg/kg ww
Milk	1.981E-8 mg/kg bw/day	0,02 mg/kg ww

3 Guidance to check compliance with the Exposure

3.1 Health

Guidance to Downstram Users (DU):

• Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2.2 are implemented

• Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3.2 Environment

Not applicable

4 Additional good practice advice beyond the REACH Chemical Safety Assessment -(Section Optional)

4.1 Control of Worker Exposure

We recommend wearing gloves when the hands may come into direct contact with the substance. Furthermore protective goggles have always to be worn because of the irritating properties of the substance to eyes.

4.2 Control of environmental exposure

No data available

Exposure Scenario 2: Intermediate

1 Exposure Scenario

1.1 Exposure Scenario Title

Industrial use resulting in manufacture of another substance / Intermediate use

1.2 Exposure Scenario Categories

Exposure scenario 2	Data field	Explanation
Sector of use categories	SU 8 SU 12 SU 24	Manufacture of bulk, large scale chemicals Manufacture of plastics products, including compounding and conversion Scientific research and development
Process categories	PROC1 PROC 2 PROC3 PROC4 PROC 7 PROC 8a PROC 8b PROC 9 PROC 14	Use in closed process, no likelihood of exposure Use in closed, continuous process with occasional controlled exposure Use in closed batch process (synthesis or formulation) Use in batch and other process (synthesis) where opportunity for exposure arises Industrial spraying Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Transfer of substance or preparation into small containers (dedicated filling line, including weighing) Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Environmental categories release	ERC 6a	Industrial use resulting in manufacture of another substance (use of intermediates

2 Operational conditions and risk management measures

2.1 Exposure and risks for workers

2.1.1 Product characteristics

Product characteristics	Data field
Physical form of product	solid at 20°C and 101.3kPa
Dustiness of material	High
Concentration of substance in mixture	Substance as such
Amount used, frequency and duration of use/exposure	Duration of activity: < 8 hours
Human factors not influenced by risk management	None identified.

2.1.2 Contributing scenarios and risk management measures

2.1.2.1 Technical and organisational conditions and measures

PROC #	Technical and organisational conditions and measures
PROC1	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Closed system (minimal contact during routine operations) • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC3	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Closed batch process with occasional controlled exposure • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC7	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: No • Local exhaust ventilation: Yes [Effectiveness Inhal: 95%] Local exhaust ventilation (LEV, effectiveness 95%) has to be used to insure safe use for workers. • Local exhaust ventilation (for dermal): no [Effectiveness Dermal: 0%] • Occupational Health and Safety Management System: Advanced
PROC2	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Closed continuous process with occasional controlled exposure • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC4 PROC8b PROC9	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Semi-closed process with occasional controlled exposure • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC 8a PROC14	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: No • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced

2.1.2.2 Conditions and measures related to personal protection, hygiene and health evaluation

PROC #	Conditions and measures related to personal protection, hygiene and health evaluation
PROC1 PROC2 PROC3 PROC9 PROC14	• Dermal Protection: No [Effectiveness Dermal: 0%] No gloves are required regarding the low level of risk for dermal exposure (RCR <1). However, we recommend wearing gloves when the hands may come into direct contact with the substance. Furthermore protective goggles have always to be worn because of the irritating properties of the substance to eyes. • Respiratory Protection: No [Effectiveness Inhal: 0%]
PROC4 PROC7 PROC8a PROC8b	• Dermal Protection: Yes (chemically resistant gloves conforming to EN374) [Effectiveness Dermal: 80%] Chemically resistant gloves conforming to EN374 (effectiveness 80%) have to be worn when handling the substance to insure a safe use for workers. Furthermore protective goggles have always to be worn because of the irritating properties of the substance to eyes . • Respiratory Protection:No [Effectiveness Inhal: 0%]

2.1.2.3 Other conditions affecting workers exposure

PROC #	Other conditions affecting workers exposure
PROC1 PROC3	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: One hand face only (240 cm 2)
PROC2 PROC4 PROC9 PROC14	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: Two hands face (480 cm 2)
PROC7	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: Two hands and upper wrists (1500 cm 2)
PROC8a PROC8b	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: Two hands (960 cm 2)

2.2 Exposure and risks for environment

2.2.1 Product characteristics

Product characteristics	Data field
Physical form of product	• Susceptibility to hydrolysis is unlikely based on its structure. • Surface activity is not a desired property of the substance based on its structure
Operational conditions	Readily biodegradable
Dustiness of material	High
Concentration of substance in mixture	Substance as such
Amount used, frequency and duration of use/exposure	• Daily use at site: <=6.4tonnes/day • Annual use at a site: <= 128 tonnes/year • Percentage of tonnage used at regional scale: = 100 %
Environmental factors not influenced by risk management	None identified.

2.2.2 Contributing scenarios and risk management measures

Conditions and measures related to sewage treatment plant
• Municipal STP: Yes [Effectiveness Water: 87.38%] • Discharge rate of STP: >= 2E3 m 3 /d • Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste (including article waste)
• Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient).
Other conditions affecting environmental exposure
• Receiving surface water flow rate: >= 1.8E4 m3/d

Local releases to the environment	
Water release factor	IInitial release factor: 0.02% Final release factor: 0.02% Local release rate: 1.28 kg/day
Air release factor	Initial release factor: 0.001% Final release factor: 0.001% Local release rate: 0.064 kg/day
Soil release factor	Final release factor: 0.1%
Explanation/ Justification: According to TGD II,The substance is covered by Industrial category IC 3 "Chemical industry: chemicals used in synthesis" (including intermediates) and with vapour pressure between 100 and 1000 Pa (default value).	

2.3 Exposure Estimation

2.3.1 Health

PROC#	**Inhalation exposure – longterm (mg/m3)**	**RCR Inhalation**	**Dermal exposure – long term (mg/kg BW/day)**	**RCR dermal**
PROC1	0,01	< 0,01	0,034	<0,01
PROC2	1	0,014	1,37	0,137
PROC3	1	0,014	0,69	0,069
PROC4	25	0,357	1,372	0,137
PROC7	5	0,071	8,572	0,857
PROC8a	50	0,714	2,742	0,274
PROC8b	25	0,357	2,742	0,274
PROC9	20	0,286	6,86	0,686
PROC14	10	0,143	3,43	0,343

2.3.2 Environment

Exposure concentrations and risks for the environment		
Protection target	**Exposure concentration**	**Risk characterisation**
Freshwater	Local PEC: 0.008 mg/L	RCR = 0.209
Sediment (freshwater)	Local PEC: 0.061 mg/kg dw	RCR = 0.96
Marine water	Local PEC: 8.074E-4 mg/L	RCR = 0.209
Sediment (marine water)	Local PEC: 0.006 mg/kg dw	RCR = 0.96
Sewage treatment plant	Local PEC: 0.081 mg/L	RCR < 0.01
Agricultural soil	Local PEC: 0.007 mg/kg dw	RCR = 0.152
Man via Environment - Inhalation	Local PEC: 9.834E-7 mg/m3	RCR < 0.01
Man via Environment - Oral	Exposure via food consumption: 7.818E-4 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

Contribution to oral intake for man via the environment from local contribution		
Type of food	**Estimated daily dose**	**Concentration in food**
Drinking water	6.877E-5 mg/kg bw/day	0.002 mg/L
Fish	3.48E-5 mg/kg bw/day	0,021 mg/kg ww
Leaf crops	5.796E-4 mg/kg bw/day	0.034 mg/kg ww
Root crops	9.849E-5 mg/kg bw/day	0.018 mg/kg ww
Meat	9.248E-8 mg/kg bw/day	2.151E-5 mg/kg ww
Milk	8.638E-8 mg/kg bw/day	1.078E-5 mg/kg ww

3 Guidance to check compliance with the Exposure

3.1 Health

Guidance to Downstram Users (DU):

• Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2.2 are implemented

• Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3.2 Environment

Not applicable

4 Additional good practice advice beyond the REACH Chemical Safety Assessment -(Section Optional)

4.1 Control of Worker Exposure

We recommend wearing gloves when the hands may come into direct contact with the substance. Furthermore protective goggles have always to be worn because of the irritating properties of the substance to eyes.

4.2 Control of environmental exposure

No data available

Exposure Scenario 3: Monomers

1 Exposure Scenario

1.1 Exposure Scenario Title

Industrial use of monomers for manufacture of thermoplastics

1.2 Exposure Scenario Categories

Exposure scenario 2	Data field	Explanation
Sector of use categories	SU 8 SU 12 SU 24	Manufacture of bulk, large scale chemicals Manufacture of plastics products, including compounding and conversion Scientific research and development
Process categories	PROC1 PROC 2 PROC3 PROC4 PROC 7 PROC 8a PROC 8b PROC 9 PROC 14	Use in closed process, no likelihood of exposure Use in closed, continuous process with occasional controlled exposure Use in closed batch process (synthesis or formulation) Use in batch and other process (synthesis) where opportunity for exposure arises Industrial spraying Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Transfer of substance or preparation into small containers (dedicated filling line, including weighing) Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Environmental categories release	ERC 6c	Industrial use of monomers for manufacture of thermoplastics

2 Operational conditions and risk management measures

2.1 Exposure and risks for workers

2.1.1 Product characteristics

Product characteristics	Data field
Physical form of product	solid at 20°C and 101.3kPa
Dustiness of material	High
Concentration of substance in mixture	Substance as such
Amount used, frequency and duration of use/exposure	Duration of activity: < 8 hours
Human factors not influenced by risk management	None identified.

2.1.2 Contributing scenarios and risk management measures

2.1.2.1 Technical and organisational conditions and measures

PROC #	Technical and organisational conditions and measures
PROC1	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Closed system (minimal contact during routine operations) • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC3	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Closed batch process with occasional controlled exposure • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC7	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: No • Local exhaust ventilation: Yes [Effectiveness Inhal: 95%] Local exhaust ventilation (LEV, effectiveness 95%) has to be used to insure safe use for workers. • Local exhaust ventilation (for dermal): no [Effectiveness Dermal: 0%] • Occupational Health and Safety Management System: Advanced
PROC2	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Closed continuous process with occasional controlled exposure • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC4 PROC8b PROC9	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: Semi-closed process with occasional controlled exposure • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced
PROC 8a PROC14	• General ventilation: Basic general ventilation (1-3 air changes per hour) • Containment: No • Local exhaust ventilation: no [Effectiveness Inhal: 0%] • Occupational Health and Safety Management System: Advanced

2.1.2.2 Conditions and measures related to personal protection, hygiene and health evaluation

PROC #	Conditions and measures related to personal protection, hygiene and health evaluation
PROC1 PROC2 PROC3 PROC9 PROC14	• Dermal Protection: No [Effectiveness Dermal: 0%] No gloves are required regarding the low level of risk for dermal exposure (RCR <1). However, we recommend wearing gloves when the hands may come into direct contact with the substance. Furthermore protective goggles have always to be worn because of the irritating properties of the substance to eyes. • Respiratory Protection: No [Effectiveness Inhal: 0%]
PROC4 PROC7 PROC8a PROC8b	• Dermal Protection: Yes (chemically resistant gloves conforming to EN374) [Effectiveness Dermal: 80%] Chemically resistant gloves conforming to EN374 (effectiveness 80%) have to be worn when handling the substance to insure a safe use for workers. Furthermore protective goggles have always to be worn because of the irritating properties of the substance to eyes . • Respiratory Protection:No [Effectiveness Inhal: 0%]

2.1.2.3 Other conditions affecting workers exposure

PROC #	Other conditions affecting workers exposure
PROC1 PROC3	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: One hand face only (240 cm 2)
PROC2 PROC4 PROC9 PROC14	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: Two hands face (480 cm 2)
PROC7	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: Two hands and upper wrists (1500 cm 2)
PROC8a PROC8b	• Place of use: Indoor • Process temperature (for solid): Ambient • Skin surface potentially exposed: Two hands (960 cm 2)

2.2 Exposure and risks for environment

2.2.1 Product characteristics

Product characteristics	Data field
Physical form of product	• Susceptibility to hydrolysis is unlikely based on its structure. • Surface activity is not a desired property of the substance based on its structure
Operational conditions	Readily biodegradable
Dustiness of material	High
Concentration of substance in mixture	Substance as such
Amount used, frequency and duration of use/exposure	• Daily use at site: <=6.4tonnes/day • Annual use at a site: <= 128 tonnes/year • Percentage of tonnage used at regional scale: = 100 %
Environmental factors not influenced by risk management	None identified.

2.2.2 Contributing scenarios and risk management measures

Conditions and measures related to sewage treatment plant
• Municipal STP: Yes [Effectiveness Water: 87.38%] • Discharge rate of STP: >= 2E3 m 3 /d • Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste (including article waste)
• Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient).
Other conditions affecting environmental exposure
• Receiving surface water flow rate: >= 1.8E4 m3/d

Local releases to the environment	
Water release factor	Initial release factor: 5E-5% Final release factor: 5E-5% Local release rate: 0.003 kg/day
Air release factor	Initial release factor: 0.075% Final release factor: 0.075% Local release rate: 4.8 kg/day
Soil release factor	Final release factor: 0 %
Explanation/ Justification: According to TGD II,The substance is covered by Industrial category IC 11 "Polymers Industry" for processing of thermosetting resins and with the use of monomers as process regulators and with vapourcpressure between 100 and 1000 Pa.	

2.3 Exposure Estimation

2.3.1 Health

PROC#	**Inhalation exposure – longterm (mg/m3)**	**RCR Inhalation**	**Dermal exposure – long term (mg/kg BW/day)**	**RCR dermal**
PROC1	0,01	< 0,01	0,034	<0,01
PROC2	1	0,014	1,37	0,137
PROC3	1	0,014	0,69	0,069
PROC4	25	0,357	1,372	0,137
PROC7	5	0,071	8,572	0,857
PROC8a	50	0,714	2,742	0,274
PROC8b	25	0,357	2,742	0,274
PROC9	20	0,286	6,86	0,686
PROC14	10	0,143	3,43	0,343

2.3.2 Environment

Exposure concentrations and risks for the environment		
Protection target	**Exposure concentration**	**Risk characterisation**
Freshwater	Local PEC: 2.03E-5 mg/L	RCR < 0.01
Sediment (freshwater)	Local PEC: 1.543E-4 mg/kg dw	RCR < 0.01
Marine water	Local PEC: 2.029E-6 mg/L	RCR < 0.01
Sediment (marine water)	Local PEC: 1.542E-5 mg/kg dw	RCR < 0.01
Sewage treatment plant	Local PEC: 2.019E-4 mg/L	RCR < 0.01
Agricultural soil	Local PEC: 3.203E-5 mg/kg dw	RCR < 0.01
Man via Environment - Inhalation	Local PEC: 7.313E-5 mg/m3	RCR < 0.01
Man via Environment - Oral	Exposure via food consumption: 0.011 mg/kg bw/day	RCR < 0.01
Man via environment - combined routes		RCR < 0.01

Contribution to oral intake for man via the environment from local contribution		
Type of food	**Estimated daily dose**	**Concentration in food**
Drinking water	6.046E-7 mg/kg bw/day	2.116E-5 mg/L
Fish	9.629E-8 mg/kg bw/day	5.861E-5 mg/kg ww
Leaf crops	0.011 mg/kg bw/day	0.645 mg/kg ww
Root crops	8.658E-7 mg/kg bw/day	1.578E-4 mg/kg ww
Meat	2.972E-6 mg/kg bw/day	6.912E-4 mg/kg ww
Milk	1.981E-8 mg/kg bw/day	2.472E-6 mg/kg ww

3 Guidance to check compliance with the Exposure

3.1 Health

Guidance to Downstram Users (DU):

• Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2.2 are implemented

• Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3.2 Environment

Not applicable

4 Additional good practice advice beyond the REACH Chemical Safety Assessment -(Section Optional)

4.1 Control of Worker Exposure

We recommend wearing gloves when the hands may come into direct contact with the substance. Furthermore protective goggles have always to be worn because of the irritating properties of the substance to eyes.

4.2 Control of environmental exposure

No data available