SAFETY DATA SHEET

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

1.1. Product identifier

Trade name or designation of the mixture	PersulfOx®
Registration number	-
Synonyms	None.
Issue date	12-February-2015
Version number	05
Revision date	07-February-2023
Supersedes date	14-October-2022

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

Identified uses	Soil and Groundwater Remediation. A complete list of registered uses for this product can be found in the table of content of the exposure scenario for communication, available as an annex to the eSDS.
Uses advised against	None known.

1.3. Details of the supplier of the safety data sheet

Company name	REGENESIS
Address	Cambridge House Henry Street Bath, Somerset BA1 1BT United Kingdom
General information	+44 (0) 1225 618161
E-mail	CustomerService@regenesis.com

1.4. Emergency telephone number

National Health Service (NHS)	111 (Available 24 hours a day). SDS/Product information may not be available for the Emergency Service.)
CHEMTREC	For Dangerous Goods Incidents ONLY (spill, leak, fire, exposure or accident), call CHEMTREC 24/7 at:
International	+1 703-741-5970
USA, Canada	(+)1-800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The mixture has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Regulation (EC) No 1272/2008 as amended

Physical hazards		
Oxidising solids	Category 3	H272 - May intensify fire; oxidiser.
Health hazards		
Acute toxicity, oral	Category 4	H302 - Harmful if swallowed.
Skin corrosion/irritation	Category 2	H315 - Causes skin irritation.
Serious eye damage/eye irritation	Category 2	
Respiratory sensitisation	Category 1	H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitisation	Category 1	H317 - May cause an allergic skin reaction.
Specific target organ toxicity - single exposure	Category 3 respiratory tract irritation	H335 - May cause respiratory irritation.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains: Silicic acid, sodium salt, Sodium persulfate

Hazard pictograms

Signal word Danger

Hazard statements

H272	May intensify fire; oxidiser.
H302	Harmful if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.

Precautionary statements

Prevention

P220	Keep away from clothing and other combustible materials.
P261	Avoid breathing dust.
P264	Wash thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P221	Take any precaution to avoid mixing with combustibles.

Response

P370 + P378	In case of fire: Use appropriate media to extinguish.

Storage Not available.

Disposal Not assigned.

Supplemental information on the label None.

2.3. Other hazards This mixture does not contain substances assessed to be vPvB / PBT according to Regulation (EC) No 1907/2006, Annex XIII.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Sodium persulfate	≥90	7775-27-1 231-892-1	01-2119495975-15-0009	-	
Classification: Ox. Sol. 3;H272, Acute Tox. 4;H302, Skin Irrit. 2;H315, Resp. Sens. 1;H334, Skin Sens. 1;H317, STOT SE 3;H335, Aquatic Chronic 3;H412					
Silicic acid, sodium salt	≤10	1344-09-8 215-687-4	01-2119448725-31-0076	-	
Classification: Skin Corr. 1B;H314, Eye Dam. 1;H318					

Composition comments The full text for all H-statements is displayed in section 16.
All concentrations are in percent by weight unless otherwise indicated.

SECTION 4: First aid measures

General information Take off all contaminated clothing immediately. Contact with combustible material may cause fire. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

4.1. Description of first aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If experiencing respiratory symptoms: Call a POISON CENTRE or doctor/physician.

Skin contact Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.

Eye contact Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion	Rinse mouth. Never give anything by mouth to a victim who is unconscious or is having convulsions. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.
4.2. Most important symptoms and effects, both acute and delayed	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Dusts may irritate the respiratory tract, skin and eyes. Difficulty in breathing. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash.
4.3. Indication of any immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

SECTION 5: Firefighting measures

General fire hazards	May intensify fire; oxidiser. Contact with combustible material may cause fire.
5.1. Extinguishing media	
Suitable extinguishing media	Water spray, fog (flooding amounts).
Unsuitable extinguishing media	Do not use water unless flooding amounts are available. Material reacts with water. Do not use carbon dioxide or other gas filled fire extinguishers; they will have no effect on decomposing persulfates.
5.2. Special hazards arising from the substance or mixture	Greatly increases the burning rate of combustible materials. Containers may explode when heated. During fire, gases hazardous to health may be formed. Combustion products may include: sulfur oxides.
5.3. Advice for firefighters	
Special protective equipment for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Special fire fighting procedures	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers.
Specific methods	Cool containers exposed to flames with water until well after the fire is out. Avoid dust formation.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep away from clothing and other combustible materials. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of dust. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.
For emergency responders	Keep unnecessary personnel away. Use personal protection recommended in Section 8 of the SDS.
6.2. Environmental precautions	Avoid discharge into drains, water courses or onto the ground.
6.3. Methods and material for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Collect dust using a vacuum cleaner equipped with HEPA filter. If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Keep combustibles (wood, paper, oil etc) away from spilled material. Ventilate the contaminated area. Stop the flow of material, if this is without risk. Spillage collected should be monitored for signs of reaction or decomposition (fuming/smoking). If spilled material is wet, dissolve with large quantity of water. Large Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Minimise dust generation and accumulation. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. Place all material into loosely covered plastic containers for later disposal. For waste disposal, see section 13 of the SDS.
6.4. Reference to other sections	For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling	Minimise dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Keep away from heat. Keep away from clothing and other combustible materials. Provide appropriate exhaust ventilation at places where dust is formed. Take any precaution to avoid mixing with combustibles. Avoid contamination. Do not taste or swallow. Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Do not store near combustible materials. Store away from incompatible materials (see Section 10 of the SDS). Recommended storage temperature: less than 40°C.

7.3. Specific end use(s)

See section 1 or exposure scenarios.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

No exposure limits noted for ingredient(s).

Biological limit values

No biological exposure limits noted for the ingredient(s).

Recommended monitoring procedures

Follow standard monitoring procedures.

Derived no effect levels (DNELs)

General population

Components	Value	Assessment factor	Notes
Silicic acid, sodium salt (CAS 1344-09-8)			
Long-term, Systemic, Dermal	0.8 mg/kg bw/day	200	Repeated dose toxicity
Long-term, Systemic, Inhalation	1.38 mg/m3	50	Repeated dose toxicity
Long-term, Systemic, Oral	0.8 mg/kg bw/day	200	Repeated dose toxicity
Sodium persulfate (CAS 7775-27-1)			
Long-term, Local, Dermal	0.051 mg/cm2	10	Repeated dose toxicity
Long-term, Local, Inhalation	1.03 mg/m3	10	Repeated dose toxicity
Long-term, Systemic, Dermal	9.1 mg/kg	10	Repeated dose toxicity
Long-term, Systemic, Inhalation	1.03 mg/m3	10	Repeated dose toxicity
Long-term, Systemic, Oral	9.1 mg/kg	10	Repeated dose toxicity
Short-term, Local, Dermal	1.124 mg/cm2	10	Acute toxicity
Short-term, Local, Inhalation	295 mg/m3	10	Acute toxicity
Short-term, Systemic, Dermal	200 mg/kg		
Short-term, Systemic, Inhalation	295 mg/m3	10	Acute toxicity
Short-term, Systemic, Oral	30 mg/kg	10	Repeated dose toxicity

Workers

Components	Value	Assessment factor	Notes
Silicic acid, sodium salt (CAS 1344-09-8)			
Long-term, Systemic, Dermal	1.59 mg/kg bw/day	100	Repeated dose toxicity
Long-term, Systemic, Inhalation	5.61 mg/m3	25	Repeated dose toxicity
Sodium persulfate (CAS 7775-27-1)			
Long-term, Local, Dermal	0.102 mg/cm2	5	Repeated dose toxicity
Long-term, Local, Inhalation	2.06 mg/m3	5	Repeated dose toxicity
Long-term, Systemic, Dermal	18.2 mg/kg	5	Repeated dose toxicity
Long-term, Systemic, Inhalation	2.06 mg/m3	5	Repeated dose toxicity
Short-term, Local, Dermal	2.248 mg/cm2	5	Acute toxicity
Short-term, Systemic, Dermal	400 mg/kg	5	Acute toxicity
Short-term, Systemic, Inhalation	590 mg/m3	5	Acute toxicity

Predicted no effect concentrations (PNECs)

Components	Value	Assessment factor	Notes
Silicic acid, sodium salt (CAS 1344-09-8)			
Freshwater	7.5 mg/l		
Intermittent releases	7.5 mg/l		
Marine water	1 mg/l		
STP	348 mg/l	1	
Sodium persulfate (CAS 7775-27-1)			
Freshwater	0.076 mg/l	1000	
Marine water	0.011 mg/l	1000	
Sediment (freshwater)	0.275 mg/kg		
Sediment (marine water)	0.04 mg/kg		
Soil	0.015 mg/kg		
STP	3.6 mg/l	10	

8.2. Exposure controls

Appropriate engineering controls	Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL (occupational exposure limit), suitable respiratory protection must be worn. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

General information	Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.
Eye/face protection	Use dust-tight, unvented chemical safety goggles when there is potential for eye contact. Face shield is recommended. Eye protection should meet standard EN 166.
Skin protection	
- Hand protection	Wear suitable gloves tested to EN374. Rubber, neoprene or PVC gloves are recommended. Breakthrough time: > 480 minutes.
- Other	Wear appropriate chemical resistant clothing.
Respiratory protection	If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL, suitable respiratory protection must be worn. Use filter type P2, P3 according to EN 143.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
Hygiene measures	Keep from contact with clothing and other combustible materials. Remove and wash contaminated clothing promptly. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

Physical state	Solid.
Form	Free-flowing powder.
Colour	White.
Odour	Odourless.
Odour threshold	Not available.
pH	11.5 (10 % solution, 25 °C (77 °F))
Melting point/freezing point	Not determined.
Initial boiling point and boiling range	Not determined.
Flash point	Not applicable.
Evaporation rate	Not available.
Flammability (solid, gas)	Oxidizer.

Upper/lower flammability or explosive limits

Explosive limit - lower (%)	Not determined.
Explosive limit – upper (%)	Not determined.
Vapour pressure	Not applicable.
Vapour density	Not applicable.
Relative density	> 1.5 - < 1.8 (20 °C (68 °F))

Solubility(ies)

Solubility (water)	Soluble in water.
Partition coefficient (n-octanol/water)	Not applicable, product is a mixture.
Auto-ignition temperature	Not determined.
Decomposition temperature	Decomposition will occur upon heating.
Viscosity	Not available.
Explosive properties	Not available.

Oxidising properties Not available.

9.2. Other information

Density Not determined.

Kinematic viscosity Not applicable.

SECTION 10: Stability and reactivity

10.1. Reactivity Keep away from combustible material. Greatly increases the burning rate of combustible materials. Decomposes on heating.

10.2. Chemical stability Decomposes on heating.

10.3. Possibility of hazardous reactions Oxidising, avoid contact with reducing agents.

10.4. Conditions to avoid Heat. Contact with incompatible materials. Avoid dust formation.

10.5. Incompatible materials Acids. Bases. Combustible material. Reducing Agents. Metals. Organic compounds.

10.6. Hazardous decomposition products Oxygen. Sulphur oxides.

SECTION 11: Toxicological information

General information Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

Inhalation May cause allergy or asthma symptoms or breathing difficulties if inhaled. Dust may irritate respiratory system.

Skin contact Causes skin irritation. May cause an allergic skin reaction.

Eye contact Causes serious eye irritation.

Ingestion Harmful if swallowed.

Symptoms Severe eye irritation. Dusts may irritate the respiratory tract, skin and eyes. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Difficulty in breathing. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash.

11.1. Information on toxicological effects

Acute toxicity Harmful if swallowed.

Components	Species	Test Results
Silicic acid, sodium salt (CAS 1344-09-8)		
Acute		
Dermal		
LD50	Rat	> 5000 mg/kg, 24 Hours
Inhalation		
Vapour		
LC50	Rat	> 2.06 mg/l, 4 Hours
Oral		
LD50	Rat	3400 mg/kg
Sodium persulfate (CAS 7775-27-1)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
LC50	Rat	2950 mg/m³, 4 h
Oral		
LD50	Rat	300 mg/kg

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Causes serious eye irritation.

Respiratory sensitisation May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin sensitisation May cause an allergic skin reaction.

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

Carcinogenicity Not classifiable as to carcinogenicity to humans.

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

Specific target organ toxicity - single exposure	May cause respiratory irritation.
Specific target organ toxicity - repeated exposure	Based on available data, the classification criteria are not met.
Aspiration hazard	Not an aspiration hazard.
Mixture versus substance information	No information available.

SECTION 12: Ecological information

12.1. Toxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components		Species	Test Results
Silicic acid, sodium salt (CAS 1344-09-8)			
Aquatic			
Acute			
Algae	EC50	Scenedesmus subspicatus	7.5 mg/l, 72 hours
Crustacea	EC50	Aquatic invertebrates	1700 mg/l, 48 hours
Fish	LC50	Danio rerio	1108 mg/l, 96 hours
		Oncorhynchus mykiss	>= 260 - <= 310 mg/l, 96 hours
	NOEC	Fish	348 mg/l, 96 hours
Sodium persulfate (CAS 7775-27-1)			
Aquatic			
Acute			
Algae	LC50	Algae	320 mg/l, 72 hours
Crustacea	EC50	Abra alba	11 mg/l, 5 days
		Daphnia magna	120 mg/l, 48 hours
Fish	LC50	Oncorhynchus mykiss	76.3 mg/l, 96 hours
		Scophthalmus maximus	107.6 mg/l, 96 hours

12.2. Persistence and degradability	The product contains inorganic compounds which are not biodegradable.
12.3. Bioaccumulative potential	No data available.
Partition coefficient n-octanol/water (log Kow)	Not applicable, product is a mixture.
Bioconcentration factor (BCF)	Not available.
12.4. Mobility in soil	No data available.
12.5. Results of PBT and vPvB assessment	This mixture does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII.
12.6. Other adverse effects	None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste	Dispose in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.
EU waste code	The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Disposal methods/information	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Special precautions	Dispose in accordance with all applicable regulations.

SECTION 14: Transport information

ADR

14.1. UN number	UN1479
14.2. UN proper shipping name	OXIDIZING SOLID, N.O.S. (Sodium persulfate)

14.3. Transport hazard class(es)

Class	5.1
Subsidiary risk	-
Label(s)	5.1
Hazard No. (ADR)	50
Tunnel restriction code	E
14.4. Packing group	III
14.5. Environmental hazards	No.
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

RID

14.1. UN number	UN1479
14.2. UN proper shipping name	OXIDIZING SOLID, N.O.S. (Sodium persulfate)

14.3. Transport hazard class(es)

Class	5.1
Subsidiary risk	-
Label(s)	5.1
14.4. Packing group	III
14.5. Environmental hazards	No.
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

ADN

14.1. UN number	UN1479
14.2. UN proper shipping name	OXIDIZING SOLID, N.O.S. (Sodium persulfate)

14.3. Transport hazard class(es)

Class	5.1
Subsidiary risk	-
Label(s)	5.1
14.4. Packing group	III
14.5. Environmental hazards	No.
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IATA

14.1. UN number	UN1479
14.2. UN proper shipping name	Oxidizing solid, n.o.s. (Sodium persulfate)

14.3. Transport hazard class(es)

Class	5.1
Subsidiary risk	-
14.4. Packing group	III
14.5. Environmental hazards	No.
ERG Code	5L
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

14.1. UN number	UN1479
14.2. UN proper shipping name	OXIDIZING SOLID, N.O.S. (Sodium persulfate)

14.3. Transport hazard class(es)

Class	5.1
Subsidiary risk	-
14.4. Packing group	III
14.5. Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-Q
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

SECTION 15: Regulatory information

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

Retained direct EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Not listed.

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended

Not listed.

Other regulations

This Safety Data Sheet is compiled in accordance with REACH Regulation (EC) No 1907/2006, as amended by UK REACH Regulations SI 2019/758. This product is classified and labelled in accordance with the retained CLP Regulation (EU) No 1272/2008, as amended for Great Britain.
Directive 2012/18/EU on major accident hazards involving dangerous substances:
Control of Major Accident Hazards Regulations 2015 [S.I. 2015/483], as amended: PART 1 (Categories of dangerous substances) - P8 OXIDIZING LIQUIDS AND SOLIDS

Use of this product by young persons under the age of 18 is not allowed in accordance with the Management of Health and Safety at Work Regulations 1999 [SI 1999/3242], as amended.

15.2. Chemical safety assessment

The chemical safety assessment has been carried out for the components of the mixture listed in section 3 of the SDS. Exposure scenarios relevant for these substances are annexed to this eSDS.

SECTION 16: Other information

List of abbreviations

ADN: European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways.
ADR: European Agreement Concerning the International Carriage of Dangerous Goods by Road.
CAS: Chemical Abstract Service.
CEN: European Committee for Standardization (Comité Européen de Normalisation).
DNEL: Derived No-Effect Level.
ECHA: European Chemical Agency.
IATA: International Air Transport Association.
IBC: Intermediate Bulk Container.
IMDG: International Maritime Dangerous Goods.
MARPOL: International Convention for the Prevention of Pollution from Ships.
PBT: Persistent, bioaccumulative, toxic.
PNEC: Predicted No-Effect Concentration.
RID: Regulations concerning the International Carriage of Dangerous Goods by Rail.
vPvB: very Persistent, very Bioaccumulative.

References

ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2019
National Toxicology Program (NTP) Report on Carcinogens

Information on evaluation method leading to the classification of mixture	The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available.
Full text of any statements, which are not written out in full under sections 2 to 15	H272 May intensify fire; oxidiser. H302 Harmful if swallowed. H314 Causes severe skin burns and eye damage. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H335 May cause respiratory irritation. H412 Harmful to aquatic life with long lasting effects.
Training information	Follow training instructions when handling this material.
Disclaimer	Regenesis cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

Annex to the extended Safety Data Sheet (eSDS)

Table of contents

1. ES 1: Formulation or re-packing Formulation into mixture

1.1. Title section

ES Name: Formulation into mixture

Environment		
1:	Formulation into mixture	ERC2
Worker		
2:	Use in closed process, no likelihood of exposure	PROC1
3:	Use in closed, continuous process with occasional controlled exposure	PROC2
4:	Use in closed batch process (synthesis or formulation)	PROC3
5:	Use in batch and other process (synthesis) where opportunity for exposure arises	PROC4
6:	Mixing or blending in batch processes (multistage and/or significant contact)	PROC5
7:	Calendering operations	PROC6
8:	Transfer of chemicals from/to vessels/ large containers at non dedicated facilities	PROC8a
9:	Transfer of chemicals from/to vessels/ large containers at dedicated facilities	PROC8b
10:	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9
11:	Treatment of articles by dipping and pouring	PROC13
12:	Tabletting, compression, extrusion or pelletisation	PROC14
13:	Use of laboratory reagents in small scale laboratories	PROC15

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

Annual amount used in the EU 40000 tonnes/year

Daily amount per site 13300 kg/day

Emission days: 300 days per year

Continuous release

Conditions and measures related to sewage treatment plant

Municipal Sewage Treatment Plant

STP effluent: 2000 m3/day

Conditions and measures related to treatment of waste (including article waste)

Contain and dispose of waste according to local regulations.

Other conditions affecting environmental exposure

Local marine water dilution factor: 1,01

Local freshwater dilution factor: 101

Receiving surface water flow >= 200000 m3/day

. Release fraction to air from process (initial release prior to RMM) 0,025 %

. Release fraction to wastewater from process (initial release prior to RMM) 0,02 %

. Release fraction to soil from process (initial release prior to RMM) 0,0001 %

. Regional use tonnage 100 %

. Fraction of regional tonnage used locally 10 %

1.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

1.2.3. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

1.2.4. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

1.2.5. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

1.2.6. Control of worker exposure: Mixing or blending in batch processes (multistage and/or significant contact) (PROC5)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

1.2.7. Control of worker exposure: Calendering operations (PROC6)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

1.2.8. Control of worker exposure: Transfer of chemicals from/to vessels/ large containers at non dedicated facilities (PROC8a)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

1.2.9. Control of worker exposure: Transfer of chemicals from/to vessels/ large containers at dedicated facilities (PROC8b)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 95 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

1.2.12. Control of worker exposure: Tabletting, compression, extrusion or pelletisation (PROC14)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

1.2.13. Control of worker exposure: Use of laboratory reagents in small scale laboratories (PROC15)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to = 100 %

Duration: Covers use up to = 8 h/day Frequency: Covers exposure up to = 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of >= 90 %

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

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Use eye protection according to EN 166.

Wear suitable coveralls to prevent exposure to the skin. Wear rubber boots.

Wash off any skin contamination immediately.

Other conditions affecting workers exposure

Indoor use

Industrial use

1.3. Exposure estimation and reference to its source

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

protection target	Exposure estimate	Method	RCR
Freshwater	1,47E-2 mg/L	EASY TRA v4.1	0,19
Freshwater sediment	5,77E-2 mg/kg dry weight	EASY TRA v4.1	0,21
Marine water	1,48E-3 mg/m³	EASY TRA v4.1	0,13
Marine sediment	5,79E-3 mg/kg dry weight	EASY TRA v4.1	0,15
Agricultural soil	1,12E-2 mg/kg dry weight	EASY TRA v4.1	0,75
Sewage treatment plant	1,33 mg/L	EASY TRA v4.1	0,37

1.3.2. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	6,86E-3 mg/kg bw/day	EASY TRA v4.1	<0,01
inhalative, systemic, long-term	1E-3 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	7E-3 mg/kg bw/day		<0,01

1.3.3. Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74E-1 mg/kg bw/day	EASY TRA v4.1	0,02
inhalative, systemic, long-term	5E-3 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	2,75E-1 mg/kg bw/day	EASY TRA v4.1	0,02

1.3.4. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	1,37E-1 mg/kg bw/day	EASY TRA v4.1	<0,01
inhalative, systemic, long-term	1E-2 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	1,39E-1 mg/kg bw/day	EASY TRA v4.1	0,01

1.3.5. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	1,37 mg/kg bw/day	EASY TRA v4.1	0,08
inhalative, systemic, long-term	5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	1,38 mg/kg bw/day	EASY TRA v4.1	0,1

1.3.6. Worker exposure: Mixing or blending in batch processes (multistage and/or significant contact) (PROC5)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	5E-2 mg/kg bw/day	EASY TRA v4.1	0,02
combined routes, systemic, long-term	2,75 mg/kg bw/day	EASY TRA v4.1	0,17

1.3.7. Worker exposure: Calendering operations (PROC6)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	5,49 mg/kg bw/day	EASY TRA v4.1	0,3
inhalative, systemic, long-term	5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	5,49 mg/kg bw/day	EASY TRA v4.1	0,33

1.3.8. Worker exposure: Transfer of chemicals from/to vessels/ large containers at non dedicated facilities (PROC8a)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	2,75 mg/kg bw/day	EASY TRA v4.1	0,17

1.3.9. Worker exposure: Transfer of chemicals from/to vessels/ large containers at dedicated facilities (PROC8b)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	5E-3 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	1,37 mg/kg bw/day	EASY TRA v4.1	0,08
inhalative, systemic, long-term	5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	1,38 mg/kg bw/day	EASY TRA v4.1	0,1

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	1E-2 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,16

1.3.12. Worker exposure: Tabletting, compression, extrusion or pelletisation (PROC14)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	6,86E-1 mg/kg bw/day	EASY TRA v4.1	0,04
inhalative, systemic, long-term	1E-2 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	6,87E-1 mg/kg bw/day	EASY TRA v4.1	0,04

1.3.13. Worker exposure: Use of laboratory reagents in small scale laboratories (PROC15)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	6,86E-2 mg/kg bw/day	EASY TRA v4.1	<0,01
inhalative, systemic, long-term	5E-3 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	6,93E-2 mg/kg bw/day	EASY TRA v4.1	<0,01

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

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.

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

2. ES 2: Use at industrial sites Industrial use of reactive processing aids

2.1. Title section

ES Name: Industrial use of reactive processing aids

Environment		
1:	Use of reactive processing aid at industrial site (no inclusion into or onto article)	ERC6b
Worker		
2:	Use in closed process, no likelihood of exposure	PROC1
3:	Use in closed, continuous process with occasional controlled exposure	PROC2
4:	Use in closed batch process (synthesis or formulation)	PROC3
5:	Use in batch and other process (synthesis) where opportunity for exposure arises	PROC4
6:	Mixing or blending in batch processes (multistage and/or significant contact)	PROC5
7:	Industrial spraying	PROC7
8:	Transfer of chemicals from/to vessels/ large containers at non dedicated facilities	PROC8a
9:	Transfer of chemicals from/to vessels/ large containers at dedicated facilities	PROC8b
10:	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9
11:	Roller application or brushing	PROC10
12:	Tabletting, compression, extrusion, pelettisation, granulation	PROC14
13:	Treatment of articles by dipping and pouring	PROC13
14:	Manufacturing and processing of minerals and/or metals at substantially elevated temperature	PROC22
15:	Open processing and transfer operations at substantially elevated temperature	PROC23
16:	Use as laboratory reagent	PROC15

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Use of reactive processing aid at industrial site (no inclusion into or onto article) (ERC6b)

Amount used (or contained in articles), frequency and duration of use/exposure

Annual amount used in the EU 40000 tonnes/year

Daily amount per site 1,333 kg/day

Emission days: 300 days per year

Continuous release

Technical and organisational conditions and measures

Control measures to prevent releases : Local exhaust ventilation - efficiency of at least Air - minimum efficiency of = 90 %

Conditions and measures related to sewage treatment plant

Municipal Sewage Treatment Plant

STP effluent: 2000 m3/day

Conditions and measures related to treatment of waste (including article waste)

Contain and dispose of waste according to local regulations.

Other conditions affecting environmental exposure

Local marine water dilution factor: 100

Local freshwater dilution factor: 10

Receiving surface water flow >= 18000 m3/day

. Release fraction to air from process (initial release prior to RMM) 0,01 %

. Release fraction to wastewater from process (initial release prior to RMM) 0 %

. Release fraction to soil from process (initial release prior to RMM) 0 %

. Regional use tonnage 10 %

. Fraction of regional tonnage used locally 10 %

2.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

2.2.3. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

2.2.4. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

2.2.5. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

2.2.6. Control of worker exposure: Mixing or blending in batch processes (multistage and/or significant contact) (PROC5)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of 95 %

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

2.2.8. Control of worker exposure: Transfer of chemicals from/to vessels/ large containers at non dedicated facilities (PROC8a)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

2.2.9. Control of worker exposure: Transfer of chemicals from/to vessels/ large containers at dedicated facilities (PROC8b)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation Inhalation - minimum efficiency of 95 %

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

2.2.12. Control of worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC14)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

2.2.14. Control of worker exposure: Manufacturing and processing of minerals and/or metals at substantially elevated temperature (PROC22)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

2.2.15. Control of worker exposure: Open processing and transfer operations at substantially elevated temperature (PROC23)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

Local exhaust ventilation 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 a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Industrial use

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: Use of reactive processing aid at industrial site (no inclusion into or onto article) (ERC6b)

protection target	Exposure estimate	Method	RCR
Freshwater	1,55E-3 mg/L	EASY TRA v4.1	0,02
Freshwater sediment	6,06E-3 mg/kg dry weight	EASY TRA v4.1	0,02
Marine water	1,58E-4 mg/L	EASY TRA v4.1	0,01
Marine sediment	6,17E-4 mg/kg dry weight	EASY TRA v4.1	0,02
Agricultural soil	4,95E-4 mg/kg dry weight	EASY TRA v4.1	0,03

2.3.2. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	6,86E-3 mg/kg bw/day	EASY TRA v4.1	<0,01
inhalative, systemic, long-term	1E-3 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	7E-3 mg/kg bw/day	EASY TRA v4.1	<0,01

2.3.3. Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74E-1 mg/kg bw/day	EASY TRA v4.1	0,02
inhalative, systemic, long-term	5E-3 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	2,75E-1 mg/kg bw/day	EASY TRA v4.1	0,02

2.3.4. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	1,37E-1 mg/kg bw/day	EASY TRA v4.1	<0,01
inhalative, systemic, long-term	1E-2 mg/m³	EASY TRA v4.1	<0,01

combined routes, systemic, long-term	1,39E-1 mg/kg bw/day	EASY TRA v4.1	0,01

2.3.5. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	1,37 mg/kg bw/day	EASY TRA v4.1	0,08
inhalative, systemic, long-term	5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	1,38 mg/kg bw/day	EASY TRA v4.1	0,1

2.3.6. Worker exposure: Mixing or blending in batch processes (multistage and/or significant contact) (PROC5)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	2,75 mg/kg bw/day	EASY TRA v4.1	0,17

2.3.7. Worker exposure: Industrial spraying (PROC7)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	8,57 mg/kg bw/day	EASY TRA v4.1	0,47
inhalative, systemic, long-term	1E-1 mg/m³	EASY TRA v4.1	0,05
combined routes, systemic, long-term	8,59 mg/kg bw/day	EASY TRA v4.1	0,52

2.3.8. Worker exposure: Transfer of chemicals from/to vessels/ large containers at non dedicated facilities (PROC8a)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	2,75 mg/kg bw/day	EASY TRA v4.1	0,17

2.3.9. Worker exposure: Transfer of chemicals from/to vessels/ large containers at dedicated facilities (PROC8b)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	5E-3 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	1,37 mg/kg bw/day	EASY TRA v4.1	0,08
inhalative, systemic, long-term	5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	1,38 mg/kg bw/day	EASY TRA v4.1	0,1

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	5,49 mg/kg bw/day	EASY TRA v4.1	0,3
inhalative, systemic, long-term	5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	5,49 mg/kg bw/day	EASY TRA v4.1	0,33

2.3.12. Worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC14)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	6,86E-1 mg/kg bw/day	EASY TRA v4.1	0,04
inhalative, systemic, long-term	1E-2 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	6,87E-1 mg/kg bw/day	EASY TRA v4.1	0,04

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	1E-2 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,16

2.3.14. Worker exposure: Manufacturing and processing of minerals and/or metals at substantially elevated temperature (PROC22)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	5,66E-1 mg/kg bw/day	EASY TRA v4.1	0,03
inhalative, systemic, long-term	3E-2 mg/m³	EASY TRA v4.1	0,01

combined routes, systemic, long-term	5,7E-1 mg/kg bw/day	EASY TRA v4.1	0,05

2.3.15. Worker exposure: Open processing and transfer operations at substantially elevated temperature (PROC23)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,83E-1 mg/kg bw/day	EASY TRA v4.1	0,02
inhalative, systemic, long-term	3E-2 mg/m³	EASY TRA v4.1	0,01
combined routes, systemic, long-term	2,87E-1 mg/kg bw/day	EASY TRA v4.1	0,03

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	6,86E-2 mg/kg bw/day	EASY TRA v4.1	<0,01
inhalative, systemic, long-term	5E-3 mg/m³	EASY TRA v4.1	<0,01
combined routes, systemic, long-term	6,93E-2 mg/kg bw/day	EASY TRA v4.1	<0,01

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

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.

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. ES 3: Widespread use by professional workers Dispersing agent; Indoor use

3.1. Title section

ES Name: Dispersing agent; Indoor use

Environment		
1:	Widespread use of reactive processing aid (no inclusion into or onto article, indoor)	ERC8b
Worker		
2:	Transfer of substance or mixture (charging/discharging) at non dedicated-facilities	PROC8a
3:	Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC8b
4:	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9
5:	Roller application or brushing	PROC10
6:	Non-industrial spraying	PROC11
7:	Treatment of articles by dipping and pouring	PROC13
8:	Tabletting, compression, extrusion, pelettisation, granulation	PROC14
9:	Use as laboratory reagent	PROC15
10:	Manual activities involving hand contact	PROC19
11:	Open processing and transfer operations at substantially elevated temperature	PROC23

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Widespread use of reactive processing aid (no inclusion into or onto article, indoor) (ERC8b)

Amount used (or contained in articles), frequency and duration of use/exposure

Annual amount used in the EU 40000 tonnes/year

Daily amount per site 21,918 kg/day

Emission days: 365 days per year

Continuous release

Conditions and measures related to sewage treatment plant

Municipal Sewage Treatment Plant

STP effluent: 2000 m3/day

Other conditions affecting environmental exposure

Local marine water dilution factor: 100

Local freshwater dilution factor: 10

Receiving surface water flow >= 18000 m3/day

. Release fraction to air from process (initial release prior to RMM) 0,1 %

. Release fraction to wastewater from process (initial release prior to RMM) 2 %

. Release fraction to soil from process (initial release prior to RMM) 0 %

. Regional use tonnage 10 %

. Fraction of regional tonnage used locally 0,2 %

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Professional use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Professional use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Professional use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Professional use

3.2.6. Control of worker exposure: Non-industrial spraying (PROC11)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 25 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Professional use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Professional use

3.2.8. Control of worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC14)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Professional use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Professional use

3.2.10. Control of worker exposure: Manual activities involving hand contact (PROC19)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 25 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Professional use

3.2.11. Control of worker exposure: Open processing and transfer operations at substantially elevated temperature (PROC23)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers use up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of >= 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Indoor use

Professional use

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure: Widespread use of reactive processing aid (no inclusion into or onto article, indoor) (ERC8b)

protection target	Exposure estimate	Method	RCR
Freshwater	2,35E-2 mg/L	EASY TRA v4.1	0,31
Freshwater sediment	9,19E-2 mg/kg dry weight	EASY TRA v4.1	0,33
Marine water	2,35E-3 mg/L	EASY TRA v4.1	0,21
Marine sediment	9,2E-3 mg/kg dry weight	EASY TRA v4.1	0,23
Agricultural soil	5E-5 mg/kg dry weight	EASY TRA v4.1	<0,01

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	1 mg/m³	EASY TRA v4.1	0,49
combined routes, systemic, long-term	2,89 mg/kg bw/day	EASY TRA v4.1	0,64

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	5E-1 mg/m³	EASY TRA v4.1	0,24
combined routes, systemic, long-term	2,81 mg/kg bw/day	EASY TRA v4.1	0,39

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	1,37 mg/kg bw/day	EASY TRA v4.1	0,08
inhalative, systemic, long-term	5E-1 mg/m³	EASY TRA v4.1	0,24
combined routes, systemic, long-term	1,44 mg/kg bw/day	EASY TRA v4.1	0,32

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	5,49 mg/kg bw/day	EASY TRA v4.1	0,3
inhalative, systemic, long-term	5E-1 mg/m³	EASY TRA v4.1	0,24
combined routes, systemic, long-term	5,56 mg/kg bw/day	EASY TRA v4.1	0,54

3.3.6. Worker exposure: Non-industrial spraying (PROC11)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	5,36 mg/kg bw/day	EASY TRA v4.1	0,29
inhalative, systemic, long-term	5E-1 mg/m³	EASY TRA v4.1	0,24
combined routes, systemic, long-term	5,43 mg/kg bw/day	EASY TRA v4.1	0,54

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
inhalative, systemic, long-term	5E-1 mg/m³	EASY TRA v4.1	0,24
combined routes, systemic, long-term	2,81 mg/kg bw/day	EASY TRA v4.1	0,39

3.3.8. Worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC14)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	6,86E-1 mg/kg bw/day	EASY TRA v4.1	0,04
inhalative, systemic, long-term	5E-1 mg/m³	EASY TRA v4.1	0,24
combined routes, systemic, long-term	7,57E-1 mg/kg bw/day	EASY TRA v4.1	0,28

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	6,86E-2 mg/kg bw/day	EASY TRA v4.1	<0,01
inhalative, systemic, long-term	5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	7,57E-2 mg/kg bw/day	EASY TRA v4.1	0,03

3.3.10. Worker exposure: Manual activities involving hand contact (PROC19)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	7,07 mg/kg bw/day	EASY TRA v4.1	0,39
inhalative, systemic, long-term	1,25E-1 mg/m³	EASY TRA v4.1	0,06
combined routes, systemic, long-term	7,09 mg/kg bw/day	EASY TRA v4.1	0,45

3.3.11. Worker exposure: Open processing and transfer operations at substantially elevated temperature (PROC23)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	3,54E-1 mg/kg bw/day	EASY TRA v4.1	0,26
inhalative, systemic, long-term	5E-1 mg/m³	EASY TRA v4.1	0,24
combined routes, systemic, long-term	3,54E-1 mg/kg bw/day	EASY TRA v4.1	0,26

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

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.

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4. ES 4: Widespread use by professional workers Dispersing agent; Outdoor use

4.1. Title section

ES Name: Dispersing agent; Outdoor use

Environment		
1:	Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)	ERC8e
Worker		
2:	Transfer of chemicals from/to vessels/ large containers at non dedicated facilities	PROC8a
3:	Transfer of chemicals from/to vessels/ large containers at dedicated facilities	PROC8b
4:	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9
5:	Roller application or brushing	PROC10
6:	Non-industrial spraying	PROC11
7:	Treatment of articles by dipping and pouring	PROC13
8:	Production or preparation or articles by tabletting, compression, extrusion or pelletisation	PROC14
9:	Use of laboratory reagents in small scale laboratories	PROC15
10:	Hand-mixing with intimate contact (only PPE available)	PROC19
11:	Open processing and transfer operations at substantially elevated temperature	PROC23

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor) (ERC8e)

Amount used (or contained in articles), frequency and duration of use/exposure

Annual amount used in the EU 40000 tonnes/year

Daily amount per site 21,918 kg/day

Emission days: 365 days per year

Continuous release

Conditions and measures related to sewage treatment plant

Municipal Sewage Treatment Plant

STP effluent: 2000 m3/day

Other conditions affecting environmental exposure

Local marine water dilution factor: 100

Local freshwater dilution factor: 10

Receiving surface water flow >= 18000 m3/day

. Release fraction to air from process (initial release prior to RMM) 0,1 %

. Release fraction to wastewater from process (initial release prior to RMM) 2 %

. Release fraction to soil from process (initial release prior to RMM) 1 %

. Regional use tonnage 10 %

. Fraction of regional tonnage used locally 0,2 %

4.2.2. Control of worker exposure: Transfer of chemicals from/to vessels/ large containers at non dedicated facilities (PROC8a)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers exposure up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Ensure procedures and training for emergency decontamination and disposal are in place.

When not in use, keep containers tightly closed.

Carefully handle the substance to minimise releases.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Outdoor use

Professional use

4.2.3. Control of worker exposure: Transfer of chemicals from/to vessels/ large containers at dedicated facilities (PROC8b)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers exposure up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Carefully handle the substance to minimise releases.

When not in use, keep containers tightly closed.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Outdoor use

Professional use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers exposure up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Carefully handle the substance to minimise releases.

When not in use, keep containers tightly closed.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Outdoor use

Professional use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers exposure up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Carefully handle the substance to minimise releases.

When not in use, keep containers tightly closed.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Outdoor use

Professional use

4.2.6. Control of worker exposure: Non-industrial spraying (PROC11)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 25 %

Duration: Covers exposure up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Carefully handle the substance to minimise releases.

When not in use, keep containers tightly closed.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Outdoor use

Professional use

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

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers exposure up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Carefully handle the substance to minimise releases.

When not in use, keep containers tightly closed.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Outdoor use

Professional use

4.2.8. Control of worker exposure: Production or preparation or articles by tabletting, compression, extrusion or pelletisation (PROC14)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers exposure up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Carefully handle the substance to minimise releases.

When not in use, keep containers tightly closed.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Outdoor use

Professional use

4.2.9. Control of worker exposure: Use of laboratory reagents in small scale laboratories (PROC15)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers exposure up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Carefully handle the substance to minimise releases.

When not in use, keep containers tightly closed.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Outdoor use

Professional use

4.2.10. Control of worker exposure: Hand-mixing with intimate contact (only PPE available) (PROC19)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 25 %

Duration: Covers exposure up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Carefully handle the substance to minimise releases.

When not in use, keep containers tightly closed.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Outdoor use

Professional use

4.2.11. Control of worker exposure: Open processing and transfer operations at substantially elevated temperature (PROC23)

Product (article) characteristics

Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers concentrations up to 100 %

Duration: Covers exposure up to 8 h/day Frequency: Covers exposure up to 5 days per week

Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Assumes a good basic standard of occupational hygiene is implemented

Carefully handle the substance to minimise releases.

When not in use, keep containers tightly closed.

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

Wear suitable gloves tested to EN374. Dermal - minimum efficiency of >= 80 %

Wear a half mask respirator with type P2L filter or better Inhalation - minimum efficiency of 90 %

Wear suitable coveralls to prevent exposure to the skin.

Wear rubber boots.

Wash off any skin contamination immediately.

Use eye protection according to EN 166.

Other conditions affecting workers exposure

Outdoor use

Professional use

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor) (ERC8e)

protection target	Exposure estimate	Method	RCR
Freshwater	2,35E-2 mg/L	EASY TRA v4.1	0,31
Freshwater sediment	9,19E-2 mg/kg dry weight	EASY TRA v4.1	0,33

Marine water	2,35E-3 mg/L	EASY TRA v4.1	0,21
Marine sediment	9,2E-3 mg/kg dry weight	EASY TRA v4.1	0,23
Agricultural soil	5E-5 mg/kg dry weight	EASY TRA v4.1	<0,01

4.3.2. Worker exposure: Transfer of chemicals from/to vessels/ large containers at non dedicated facilities (PROC8a)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
Inhalation, systemic, long-term	7E-1 mg/m³	EASY TRA v4.1	0,34
combined routes, systemic, long-term	2,84 mg/kg bw/day	EASY TRA v4.1	0,49

4.3.3. Worker exposure: Transfer of chemicals from/to vessels/ large containers at dedicated facilities (PROC8b)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
Inhalation, systemic, long-term	3,5E-1 mg/m³	EASY TRA v4.1	0,17
combined routes, systemic, long-term	2,79 mg/kg bw/day	EASY TRA v4.1	0,32

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	1,37 mg/kg bw/day	EASY TRA v4.1	0,08
Inhalation, systemic, long-term	3,5E-1 mg/m³	EASY TRA v4.1	0,17
combined routes, systemic, long-term	1,42 mg/kg bw/day	EASY TRA v4.1	0,25

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	5,49 mg/kg bw/day	EASY TRA v4.1	0,3
Inhalation, systemic, long-term	3,5E-1 mg/m³	EASY TRA v4.1	0,17
combined routes, systemic, long-term	5,54 mg/kg bw/day	EASY TRA v4.1	0,47

4.3.6. Worker exposure: Non-industrial spraying (PROC11)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	5,36 mg/kg bw/day	EASY TRA v4.1	0,29
Inhalation, systemic, long-term	3,5E-1 mg/m³	EASY TRA v4.1	0,17
combined routes, systemic, long-term	5,41 mg/kg bw/day	EASY TRA v4.1	0,46

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

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,74 mg/kg bw/day	EASY TRA v4.1	0,15
Inhalation, systemic, long-term	3,5E-1 mg/m³	EASY TRA v4.1	0,17
combined routes, systemic, long-term	2,79 mg/kg bw/day	EASY TRA v4.1	0,32

4.3.8. Worker exposure: Production or preparation or articles by tabletting, compression, extrusion or pelletisation (PROC14)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	6,86E-1 mg/kg bw/day	EASY TRA v4.1	0,04
Inhalation, systemic, long-term	3,5E-1 mg/m³	EASY TRA v4.1	0,17
combined routes, systemic, long-term	7,36E-1 mg/kg bw/day	EASY TRA v4.1	0,21

4.3.9. Worker exposure: Use of laboratory reagents in small scale laboratories (PROC15)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	6,86E-2 mg/kg bw/day	EASY TRA v4.1	<0,01
Inhalation, systemic, long-term	3,5E-2 mg/m³	EASY TRA v4.1	0,02
combined routes, systemic, long-term	7,36E-2 mg/kg bw/day	EASY TRA v4.1	0,02

4.3.10. Worker exposure: Hand-mixing with intimate contact (only PPE available) (PROC19)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	7,07 mg/kg bw/day	EASY TRA v4.1	0,39
Inhalation, systemic, long-term	8,75E-2 mg/m³	EASY TRA v4.1	0,04
combined routes, systemic, long-term	7,08 mg/kg bw/day	EASY TRA v4.1	0,43

4.3.11. Worker exposure: Open processing and transfer operations at substantially elevated temperature (PROC23)

Route of exposure and type of effects	Exposure estimate	Method	RCR
dermal, systemic, long-term	2,83E-1 mg/kg bw/day	EASY TRA v4.1	0,02
Inhalation, systemic, long-term	3,5E-1 mg/m³	EASY TRA v4.1	0,17
combined routes, systemic, long-term	3,33E-1 mg/kg bw/day	EASY TRA v4.1	0,19

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

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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

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.