

This safety data sheet was created pursuant to the requirements of:
UK REACH Regulations (SI 2019/758 as amended)

Supersedes date 11-Mar-2020

Revision date 09-Feb-2025

Revision Number 6

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

1.1. Product identifier

Product Code(s)	20187
Safety data sheet number	20187
Product Name	DISODIUM TETRABORATE, ANHYDROUS
Index No	005-011-00-4
EC Number	215-540-4
CAS No	1303-96-4
Synonyms	Borax decahydrate, DISODIUM TETRABORATE DECAHYDRATE, BORAX, BORAX DECAHYDRATE NF GRADES, BORAX DECAHYDRATE SP GRADES, BORAX DECAHYDRATE EP GRADES, BORAX 10 HYDRAT, BORAX EP GRANULER, BORAX 10 HYDRATE CRYSTAL POWDER, BORAX TECH 10AQ GRAN, BORAX TG, BORAX DECAHYDRATE - TECHNICAL, BORAX DECAHYD GRAN, SODIUM TETRABORATE DECAHYDRATE, DISODIUM TETRABORATE, BORAX DECAHYD SP GRAN, BORAX DECAHYD GRAN ETS
Pure substance/mixture	Substance
Contains SODIUM TETRABORATE DECAHYDRATE	
Formula	Na ₂ B ₄ O ₇ ·10H ₂ O
Molecular weight	381.37 g/mol

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

Recommended use	Industrial use Borosilicate glass Ceramics Detergent Fiberglass Starch glue Binding agent Chemical production Complexing agent Corrosion inhibitor Anti Scaling agent Fertiliser Flame retardant Flux agents for casting Chemical intermediate Laboratory chemicals Lubricants and lubricant additives Oxidising agents Photosensitive agents and other photo chemicals pH control
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plating agents and metal surface treating agents
Process regulator
Processing aid.
Stabiliser
Surface active agents
Viscosity modifiers
For further information, see attached Exposure Scenario

Uses advised against Consumer use

1.3. Details of the supplier of the safety data sheet

Supplier

Univar Solutions UK Ltd
Aquarius House
6 Mid Point Business Park
Bradford
GBR

For further information, please contact

E-mail address SDS.EMEA@univarsolutions.com

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

1.4. Emergency telephone number

Emergency Telephone SGS - +32 (0)3 575 55 55 (24h)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Serious eye damage/eye irritation	Category 2 - (H319)
Reproductive toxicity	Category 1B - (H360FD)

2.2. Label elements

Contains SODIUM TETRABORATE DECAHYDRATE



Signal word

Danger

Hazard statements

H319 - Causes serious eye irritation
H360FD - May damage fertility. May damage the unborn child
Restricted to professional users

Precautionary statements

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P308 + P313 - IF exposed or concerned: Get medical advice/attention
P501 - Dispose of contents/ container to an approved waste disposal plant

2.3. Other hazards

No information available.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Weight-%	EC No (EU Index No)	UK REACH registration number	Classification according to GB CLP (SI 2020/1567 as amended)	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)
SODIUM TETRABORATE DECAHYDRATE 1303-96-4	> 99.4 %	215-540-4 (005-011-00-4)	-	Repr. 1B (H360FD)	Repr. 1B :: C>=8.5%	-	-

Full text of H- and EUH-phrases: see section 16

Chemical name	CAS No	SVHC candidates
SODIUM TETRABORATE DECAHYDRATE	1303-96-4	X

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Rinse mouth thoroughly with water. Get medical attention if symptoms occur.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if symptoms occur.
Skin contact	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Get medical attention if symptoms occur.
Ingestion	Rinse mouth thoroughly with water. Do NOT induce vomiting. Drink plenty of water. Get medical attention if symptoms occur.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms	May damage fertility. May damage the unborn child.
Inhalation	Overexposure may cause the following adverse effects. Dust may irritate respiratory tracts. Coughing and/ or wheezing.
Eyes	Causes serious eye irritation. Overexposure may cause the following adverse effects. May cause redness and tearing of the eyes. Pain. Irritation.
Dermal	Symptoms of accidental over-exposure to high doses of inorganic borate salts have been associated with ingestion or absorption through large areas of severely damaged skin.

	Antiemetic (Vomiting and Nausea). Diarrhoea. delayed effects of skin redness and peeling.
Ingestion	Symptoms of accidental over-exposure to high doses of inorganic borate salts have been associated with ingestion or absorption through large areas of severely damaged skin. Antiemetic (Vomiting and Nausea) Diarrhoea. delayed effects of skin redness and peeling.

4.3. Indication of any immediate medical attention and special treatment needed

Note to doctors	Supportive care only is required for adult ingestion of less than a few grams of the product. For ingestion of larger amounts, maintain fluid and electrolyte balance and maintain adequate kidney function. Gastric lavage is only recommended for heavily exposed, symptomatic patients in whom emesis has not emptied the stomach. Hemodialysis should be reserved for patients with massive acute absorption, especially for patients with compromised renal function. Boron analyses of urine or blood are only useful for verifying exposure and are not useful for evaluating severity of poisoning or as a guide in treatment.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media	Water spray. Dry chemical. powder. Foam. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Large Fire	CAUTION: Use of water spray when fighting fire may be inefficient.

Unsuitable extinguishing media	Do not scatter spilled material with high pressure water streams.
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5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical	When heated and in case of fire, toxic vapours/gases may be formed. The product is not flammable, combustible or explosive.
Hazardous combustion products	Carbon oxides.

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.
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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Ensure adequate ventilation. Use personal protection recommended in Section 8. Avoid contact with eyes, skin and clothing. Avoid breathing dust. No action shall be taken involving any personal risk or without suitable training.
Other information	Refer to protective measures listed in Sections 7 and 8.
For emergency responders	Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions	See Section 12 for additional Ecological Information.
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6.3. Methods and material for containment and cleaning up

Methods for containment	Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Move containers from fire area if you can do it without risk. Keep upwind. Remove spillage with vacuum cleaner. If not possible, collect spillage with shovel, broom or the like. Take up mechanically, placing in appropriate containers for disposal. Do not allow run-off from fire-fighting to enter drains or water courses.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling Ensure adequate ventilation. Use personal protection recommended in Section 8. Avoid contact with eyes, skin and clothing. Do not breathe dust. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid spilling.

General hygiene considerations Wash work clothing and protective equipment separately from regular wash. Do not eat, drink or smoke when using the product. Wash hands before breaks and immediately after handling the product. Remove contaminated clothing and protective equipment before entering eating areas. Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed in a dry and well-ventilated place. Store indoors. Keep at temperatures between 5 and 30 °C. Store locked up.

7.3. Specific end use(s)

Specific use(s)
See section 1 for more information.

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical name	United Kingdom
SODIUM TETRABORATE DECAHYDRATE 1303-96-4	TWA: 5 mg/m ³ STEL: 15 mg/m ³

Biological occupational exposure limits This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Derived No Effect Level (DNEL) - Workers

Chemical name	Oral	Dermal	Inhalation
SODIUM TETRABORATE DECAHYDRATE 1303-96-4		599.6 mg/kg/day [4] [6]	12.76 mg/m ³ [4] [6] 22.3 mg/m ³ [5] [6] 22.3 mg/m ³ [5] [7]

[4] Systemic health effects.
[5] Local health effects.
[6] Long term.
[7] Short term.

Derived No Effect Level (DNEL) - General Public

Chemical name	Oral	Dermal	Inhalation
SODIUM TETRABORATE DECAHYDRATE 1303-96-4	1.51 mg/kg/day [4] [6] 1.51 mg/kg/day [4] [7]	303.5 mg/kg/day [4] [6]	6.5 mg/m ³ [4] [6] 22.3 mg/m ³ [5] [6] 22.3 mg/m ³ [5] [7]

[4] Systemic health effects.
 [5] Local health effects.
 [6] Long term.
 [7] Short term.

Predicted No Effect Concentration (PNEC)

Chemical name	Freshwater	Freshwater (intermittent release)	Marine water	Marine water (intermittent release)	Air
SODIUM TETRABORATE DECAHYDRATE 1303-96-4	2.9 mg/l	13.7 mg/l	2.9 mg/l		

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
SODIUM TETRABORATE DECAHYDRATE 1303-96-4			10 mg/l	5.7 mg/kg dwt	

8.2. Exposure controls

Engineering controls No information available.

Personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles). Use eye protection according to EN 166.

Hand protection Wear suitable gloves. Gloves must conform to standard EN 374.

Skin and body protection Wear appropriate clothing to prevent reasonably probable skin contact.

Respiratory protection Use appropriate respiratory protection.
 Use effective dust masks.

General hygiene considerations Wash work clothing and protective equipment separately from regular wash. Do not eat, drink or smoke when using the product. Wash hands before breaks and immediately after handling the product. Remove contaminated clothing and protective equipment before entering eating areas. Handle in accordance with good industrial hygiene and safety practice.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Physical state Solid
Appearance solid Crystalline solid granules Powder
Colour white
Odour Odourless.
Odour threshold No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Melting point / freezing point	> 741 °C	
Initial boiling point and boiling range	1575 °C	
Flammability		The product is not flammable.
Flammability Limit in Air		Not applicable.
Upper flammability or explosive limits		
Lower flammability or explosive limits		
Flash point		The product is not flammable.
Autoignition temperature		Not applicable.
Decomposition temperature		No information available.
pH	9.2	No information available.
pH (as aqueous solution)		No information available.
Kinematic viscosity		Not applicable.
Dynamic viscosity		Not applicable.
Water solubility	Soluble in water 4.7% @ 20°C 65.6% @ 100°C	Water.
Solubility(ies)		No information available.
Partition coefficient	-0.757	
Vapour pressure		negligible.
Relative density	1.71 - 1.72	20 °C.
Bulk density		No information available
Liquid Density	No information available	No information available
Relative vapour density		Not applicable.
Particle characteristics		No information available.
Particle Size	No information available	
Particle Size Distribution	No information available	
Explosive properties	Not considered to be explosive.	
Oxidising properties	Does not meet the criteria for classification as oxidising	
9.2. Other information		
Molecular weight	381.37 g/mol	

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity No known effects under normal use conditions.

10.2. Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Reaction with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas which could create an explosive hazard.

10.4. Conditions to avoid

Conditions to avoid None known based on information supplied.

10.5. Incompatible materials

Incompatible materials Avoid contact with strong reducing agents such as metal hydrides, acetic anhydride or alkali metals.

10.6. Hazardous decomposition products

Hazardous decomposition products Carbon oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure

Product Information

Inhalation	Inhalation of dust in high concentration may cause irritation of respiratory system. Overexposure may cause the following adverse effects. Dust may irritate respiratory tracts. Coughing and/ or wheezing.
Eye contact	Causes serious eye irritation. Overexposure may cause the following adverse effects. May cause redness and tearing of the eyes. Pain. Irritation.
Skin contact	Non-irritating during normal use. Overexposure may cause the following adverse effects. Symptoms of accidental over-exposure to high doses of inorganic borate salts have been associated with ingestion or absorption through large areas of severely damaged skin. Antiemetic (Vomiting and Nausea). Diarrhoea. delayed effects of skin redness and peeling.
Ingestion	Symptoms of accidental over-exposure to high doses of inorganic borate salts have been associated with ingestion or absorption through large areas of severely damaged skin. Antiemetic (Vomiting and Nausea). Diarrhoea. delayed effects of skin redness and peeling.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms May damage fertility. May damage the unborn child.

Acute toxicity

Numerical measures of toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
SODIUM TETRABORATE DECAHYDRATE	5150 - 6000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 2.03 mg/l (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Non-irritating during normal use. Based on available data the classification criteria are not met.

Method	Species	Exposure route	Effective dose	Exposure time	Results
	Rabbit	Dermal	0.5 g moistened with saline		non-irritant

Serious eye damage/eye irritation Causes serious eye irritation.

Method	Species	Exposure route	Effective dose	Exposure time	Results
	Rabbit	eye	0.08 mL		Irritant

Respiratory or skin sensitisation Not a skin sensitiser. Based on available data the classification criteria are not met.

SODIUM TETRABORATE DECAHYDRATE (1303-96-4)

Method	Species	Exposure route	Results
	Guinea pig	Dermal	Not a skin sensitiser

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

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

Reproductive toxicity May damage fertility. May damage the unborn child.

The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as reproductive toxins.

Chemical name	United Kingdom
SODIUM TETRABORATE DECAHYDRATE	Repr. 1B

STOT - single exposure Based on available data the classification criteria are not met.

STOT - repeated exposure Based on available data the classification criteria are not met.

Aspiration hazard Based on available data the classification criteria are not met.

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity Not considered to be harmful to aquatic life.

SODIUM TETRABORATE DECAHYDRATE (1303-96-4)

Method	Species	Endpoint type	Effective dose	Exposure time	Results
	Fish Limanda limanda	LC50	74 mg/L		
	Fish Pimephales promelas	LC50	79.7 mg/L		
	Algae Phaeodactylum tricornutum	EC50	66 mg/L	72 hours	
	Algae Phaeodactylum tricornutum	EC50	54 mg/L	72 hours	
Chronic toxicity	Brachydanio rerio	NOEC	6.4 mg/L	34 days	

12.2. Persistence and degradability

Persistence and degradability Boron is naturally occurring and ubiquitous in the environment. Disodium tetraborate decahydrate decomposes in the environment to natural borate.

12.3. Bioaccumulative potential

Bioaccumulation MATERIAL DOES NOT BIOACCUMULATE.

Component Information

Chemical name	Partition coefficient
SODIUM TETRABORATE DECAHYDRATE	-0.757

12.4. Mobility in soil

Mobility in soil Soluble in water.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment The product does not contain any substance(s) classified as PBT or vPvB.

12.6. Other adverse effects

No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

SECTION 14: Transport information

IATA

14.1 UN number or ID number Not regulated

14.2

14.3 Transport hazard class(es) Not regulated

14.4 Packing group Not regulated

14.5 Environmental hazards No

14.6 Special precautions for user
Special Provisions None

IMDG

14.1 UN number or ID number Not regulated

14.3 Transport hazard class(es) Not regulated

14.4 Packing group Not regulated

14.5 Environmental hazards No

14.6 Special precautions for user
Special Provisions None

14.7 Maritime transport in bulk according to IMO instruments No information available

RID

14.1 UN number or ID number Not regulated

14.2 UN proper shipping name Not regulated

14.3 Transport hazard class(es) Not regulated

14.4 Packing group Not regulated

14.5 Environmental hazards No

14.6 Special precautions for user
Special Provisions None

ADR

14.1 UN number or ID number Not regulated

14.2 UN proper shipping name Not regulated

14.3 Transport hazard class(es) Not regulated

14.4 Packing group Not regulated

14.5 Environmental hazards No

14.6 Special precautions for user
Special Provisions None

SECTION 15: Regulatory information

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

National regulations

Authorisations and/or restrictions on use:

This product contains one or more substances subject to restriction (UK REACH - Annex XVII).

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
SODIUM TETRABORATE DECAHYDRATE - 1303-96-4	Use restricted. See item 30. Restricted Reproductive Toxin 1B	-

Persistent Organic Pollutants

Not applicable

Export Notification requirements

Not applicable

Named dangerous substances per COMAH Regulations 2015 (as amended)

Not applicable

The Ozone-Depleting Substances Regulations 2015

Not applicable

The Biocidal Products Regulations 2001 (as amended)

Not applicable

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended)

Not applicable

Poisons Act 1972 (Explosive Precursors) Regulations (as Amended)

Not applicable

International Inventories

TSCA	Contact supplier for inventory compliance status
DSL/NDL	Contact supplier for inventory compliance status
EINECS/ELINCS	Contact supplier for inventory compliance status
ENCS	Contact supplier for inventory compliance status
IECSC	Contact supplier for inventory compliance status
KECI	Contact supplier for inventory compliance status
PICCS	Contact supplier for inventory compliance status
AIIC	Contact supplier for inventory compliance status
NZIoC	Contact supplier for inventory compliance status

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AIIC - Australian Inventory of Industrial Chemicals
NZIoC - New Zealand Inventory of Chemicals

15.2. Chemical safety assessment

Chemical Safety Report No information available

SECTION 16: Other information**Key or legend to abbreviations and acronyms used in the safety data sheet****Full text of H-Statements referred to under section 3**

H360FD - May damage fertility. May damage the unborn child

Legend

SVHC: Substances of Very High Concern for Authorisation:

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation
+	Sensitisers		

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Classification procedure

Classification according to Regulation (EC) No. 1272/2008 [CLP]	Method Used
Acute oral toxicity	Calculation method
Acute dermal toxicity	Calculation method
Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - vapour	Calculation method
Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	Calculation method
Serious eye damage/eye irritation	Calculation method
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method
Mutagenicity	Calculation method
Carcinogenicity	Calculation method
STOT - single exposure	Calculation method
STOT - repeated exposure	Calculation method
Acute aquatic toxicity	Calculation method
Chronic aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)
 U.S. Environmental Protection Agency ChemView Database
 European Food Safety Authority (EFSA)
 European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA_RAC)
 European Chemicals Agency (ECHA) (ECHA_API)
 Environmental Protection Agency
 Acute Exposure Guideline Level(s) (AELG(s))
 U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
 U.S. Environmental Protection Agency High Production Volume Chemicals
 Food Research Journal
 Hazardous Substance Database
 International Uniform Chemical Information Database (IUCLID)
 National Institute of Technology and Evaluation (NITE)
 Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
 NIOSH (National Institute for Occupational Safety and Health)
 National Library of Medicine's ChemID Plus (NLM CIP)
 National Library of Medicine's PubMed database (NLM PUBMED)
 U.S. National Toxicology Program (NTP)
 New Zealand's Chemical Classification and Information Database (CCID)
 Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications
 Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
 Organisation for Economic Co-operation and Development Screening Information Data Set
 World Health Organization

Prepared By Lisa Bland

Supersedes date 11-Mar-2020

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This material safety data sheet complies with the requirements of UK REACH Regulations (SI 2019/758 as amended)
 Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the

date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Formulation & (re)packing of substances and mixtures
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC2 - Formulation of preparations (mixtures)
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Amounts used

Type	Daily amount per site
Value	<= 66660
Units	kg/d

Type	Annual amount per site
Value	<= 10000
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
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Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Automate activity where possible Partial personal enclosure with ventilation Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 Ensure containment of the emission source
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a closed system Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Solid, medium dustiness
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Automate activity where possible Partial personal enclosure with ventilation Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 Ensure containment of the emission source
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Local exhaust ventilation - efficiency of at least 90% General ventilation 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line,
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	including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	1000 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	1000 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible

	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	25%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Wet cleaning of the workplace Clean equipment and the work area every day
Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Wet cleaning of the workplace Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.385 mg/L	0.133
Marine water	0.038 mg/L	0.013
STP: Sewage Treatment Plant	3.332 mg/L	0.333
Soil	0.165 mg/kg dw	0.029

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.8 mg/m ³	0.552
PROC8a - Transfer of substance or	Worker - dermal, long-term -	6.825 mg/kg bw/day	0.099

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	systemic		
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.651
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.82 mg/m ³	0.566
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	6.825 mg/kg bw/day	0.099
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.665
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.67 mg/m ³	0.462
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - dermal, long-term - systemic	20.37 mg/kg bw/day	0.297

from/to vessels/large containers at non dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.518 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.225
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.175
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.008 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.031 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.008 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.031 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.492 mg/kg bw/day	0.036

PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.492 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.116
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
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Section 1 - Title

Title Formulation & (re)packing of substances and mixtures
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC3 - Formulation in materials
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC7 - Industrial spraying
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
 PROC15 - Use as laboratory reagent
 PROC23 - Open processing and transfer operations with minerals/metals at elevated temperature
 PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC3 - Formulation in materials

Amounts used

Type	Daily amount per site
Value	<= 27500
Units	kg/d

Type	Annual amount per site
Value	<= 10000
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a closed system Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
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Covers concentrations up to	> 25%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Local exhaust ventilation - efficiency of at least 90% General ventilation 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	1000 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	500 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	1%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Open windows during application to ensure natural ventilation Ensure that spray direction is only horizontal or downward Surface spraying with no or low compressed air use Low application rate (0.03 - 0.3 l/minute) Surface spraying of liquids
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC23 - Open processing and transfer operations with minerals/metals at elevated temperature
Covers concentrations up to	1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	1000 C

Process category(ies)	PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a closed system Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	<= 25%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached)

the worker	Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC3 - Formulation in materials

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/L	0.0188
Marine water	0.00508 mg/L	< 0.01
STP: Sewage Treatment Plant	0 mg/L	< 0.01
Soil	0.147 mg/kg dw	0.026

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		<0.01
PROC8a - Transfer of substance or	Worker - inhalative, long-term	0.67 mg/m ³	0.462

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	- systemic		
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	20.38 mg/kg bw/day	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.518 mg/kg bw/day	<0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.225
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.379 mg/m ³	0.261
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	<0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.262
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.42 mg/m ³	0.29
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	7.501 mg/kg bw/day	0.109
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.399
PROC23 - Open processing and transfer operations with minerals/metals at elevated temperature	Worker - inhalative, long-term - systemic	0.19 mg/m ³	0.131
PROC23 - Open processing and transfer operations with minerals/metals at elevated temperature	Worker - dermal, long-term - systemic	0.102 mg/kg bw/day	< 0.01
PROC23 - Open processing and transfer operations with minerals/metals at elevated temperature	Worker - combined, long-term - systemic		0.133
PROC24 - High (mechanical) energy work-up of substances bound in	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088

materials and/or articles			
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	<0.01
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - combined, long-term - systemic		0.088
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	<0.01
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.089
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.19 mg/m ³	0.131
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.031 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.131
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.038 mg/m ³	0.026
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.031 mg/kg bw/day	<0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.027
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	<0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	<0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term -	0.104 mg/kg bw/day	< 0.01

	systemic		
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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 GBR

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Section 1 - Title

Title Manufacture of fabricated metal products, except machinery and equipment
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Product category(ies) PROC28 - Manual maintenance (cleaning and repair) of machinery
 PC0 - Other Products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU15 - Manufacture of fabricated metal products, except machinery and equipment

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Amounts used

Type	Daily amount per site
Value	<= 1500
Units	kg/d

Type	Annual amount per site
Value	<= 500
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Wet cleaning of the workplace Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.801 mg/L	0.276
Marine water	0.08 mg/L	0.028
STP: Sewage Treatment Plant	7.497 mg/L	0.75
Soil	0.187 mg/kg dw	0.033

Derived No Effect Level (DNEL):

Calculation method MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.028 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.273 mg/kg bw/day	< 0.01
PROC24 - High (mechanical) energy	Worker - combined, long-term		0.178

work-up of substances bound in materials and/or articles	- systemic		
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.231 mg/m ³	0.159
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.167

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Adhesives, sealants
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC5 - Industrial use resulting in inclusion into or onto a matrix
Specific Environmental Release Category FEICA SPERC 5.1a.v3
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC7 - Industrial spraying
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC10 - Roller application or brushing
 PROC11 - Non industrial spraying
 PROC13 - Treatment of articles by dipping and pouring
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC1 - Adhesives, sealants
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU6a - Manufacture of wood and wood products SU6b - Manufacture of pulp, paper and paper products SU16 - Manufacture of computer, electronic and optical products, electrical equipment SU17 - General manufacturing SU18 - Manufacture of furniture SU19 - Building and construction work

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix
Specific Environmental Release Category - FEICA SPERC 5.1a.v3

Amounts used

Type	Daily amount per site
Value	<= 200
Units	kg/d

Type	Annual amount per site
Value	<= 50
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Further information

Operational conditions	Indoor use
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
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Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached)

the worker	Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Assumes process temperature up to	40 C
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Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Surface spraying of liquids Low application rate (0.03 - 0.3 l/minute) Ensure that spray direction is only horizontal or downward Surface spraying with no or low compressed air use General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Wear a respirator providing a minimum efficiency of 95% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix
Specific Environmental Release Category - FEICA SPERC 5.1a.v3

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/L	0.018
Marine water	0.00508 mg/L	< 0.01
STP: Sewage Treatment Plant	0 mg/L	< 0.01

Soil	0.146 mg/kg dw	0.026
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Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.006 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.006 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.006 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.006 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.015 mg/m ³	0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.008 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01

dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.008 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.015 mg/m ³	0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.008 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.008 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.09
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.09
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.72 mg/m ³	0.497
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	11.55 mg/kg bw/day	0.168
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.665
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	1.047 mg/m ³	0.722
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.468 mg/kg bw/day	0.065
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.787
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC10 - Roller application or	Worker - dermal, long-term -	0.3 mg/kg bw/day	< 0.01

brushing	systemic		
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.179
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	0.3 mg/kg bw/day	< 0.01
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.179
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.05 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.05 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
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 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

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Section 1 - Title

Title Laboratory chemicals Scientific research and development
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
 ERC6b - Industrial use of reactive processing aids
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC21 - Laboratory chemicals
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU24 - Scientific research and development

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
 - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Daily amount per site
Value	<= 2500
Units	kg/d

Type	Annual amount per site
Value	50
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Wet cleaning of the workplace Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Mechanical ventilation giving at least 1 ACH

the worker	
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Wet cleaning of the workplace Clean equipment and the work area every day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
- ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.676 mg/L	0.233
Marine water	0.068 mg/L	0.023
STP: Sewage Treatment Plant	6.248 mg/L	0.625
Soil	0.185 mg/kg dw	0.033

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.032 mg/m ³	0.022
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.052 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers	Worker - combined, long-term - systemic		0.023

(dedicated filling line, including weighing)			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.863 mg/kg bw/day	0.027
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.76

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Products such as pH-regulators, flocculants, precipitants, neutralisation agents Manufacture of pulp, paper and paper products

Type Worker

Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
 ERC6b - Industrial use of reactive processing aids

Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery

Product category(ies) PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents

Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU6b - Manufacture of pulp, paper and paper products

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
 - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Daily amount per site
Value	<= 1250
Units	kg/d

Type	Annual amount per site
Value	<= 25
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or	>= 18000 m3/day
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marine)	
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	>25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	>25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Local exhaust ventilation - efficiency of at least 90% General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached)

the worker	Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Indoor/Outdoor use	Covers indoor and outdoor use
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Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
- ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.676 mg/L	0.233
Marine water	0.068 mg/L	0.023
STP: Sewage Treatment Plant	6.248 mg/L	0.625
Soil	0.185 mg/kg dw	0.032

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01

PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.67 mg/m ³	0.462
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	20.38 mg/kg bw/day	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.518 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.225
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.088
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.863 mg/kg bw/day	0.027
PROC28 - Manual maintenance	Worker - combined, long-term		0.76

(cleaning and repair) of machinery	- systemic		
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Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Polymer preparations and compounds Manufacture of bulk, large scale chemicals (including petroleum products)

Type Worker

Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category(ies) ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product category(ies) PC32 - Polymer preparations and compounds

Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Amounts used

Type	Daily amount per site
Value	<= 250
Units	kg/d

Type	Annual amount per site
Value	<= 5
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Local exhaust ventilation - efficiency of at least 90% General ventilation 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Automate activity where possible Local exhaust ventilation - efficiency of at least 90% General ventilation 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent	Clean equipment and the work area every day

/limit releases, dispersion and exposure	Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor
Assumes process temperature up to	100 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.301 mg/L	0.104	
Marine water	0.03 mg/L	0.01	
STP: Sewage Treatment Plant	2.499 mg/L	0.25	
Soil	0.158 mg/kg dw	0.028	

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous	Worker - inhalative, long-term	0.011 mg/m ³	< 0.01

process with occasional controlled exposure	- systemic		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.67 mg/m ³	0.462
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	20.38 mg/kg bw/day	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.518 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.225
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	0.48 mg/m ³	0.331
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	4.435 mg/kg bw/day	0.065
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.396

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Polymer preparations and compounds General manufacturing
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6b - Industrial use of reactive processing aids
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Product category(ies) PC32 - Polymer preparations and compounds
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU17 - General manufacturing

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Daily amount per site
Value	<= 250
Units	kg/d

Type	Annual amount per site
Value	<= 5
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once

control dispersion from source towards the worker	a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Local exhaust ventilation - efficiency of at least 90% General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Automate activity where possible Handling of very large amounts of product Local exhaust ventilation - efficiency of at least 90% General ventilation 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place

exposure	
Assumes process temperature up to	100 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.676 mg/l	0.233
Marine water	0.068 mg/l	0.023
STP: Sewage Treatment Plant	6.248 mg/l	0.625
Soil	0.179 mg/kg dw	0.031

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous	Worker - dermal, long-term -	0.035 mg/kg bw/day	< 0.01

process with occasional controlled exposure	systemic		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.67 mg/m ³	0.462
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	20.38 mg/kg bw/day	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.252 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.222
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	0.48 mg/m ³	0.331
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	4.435 mg/kg bw/day	0.065
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.396

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Building and construction work
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC5 - Industrial use resulting in inclusion into or onto a matrix
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC11 - Non industrial spraying
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU19 - Building and construction work

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Amounts used

Type	Daily amount per site
Value	<= 1000
Units	kg/d

Type	Annual amount per site
Value	<= 20
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 95% Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method

Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0 mg/l	< 0.01
Soil	0.146 mg/kg dw	0.026

Derived No Effect Level (DNEL):

Calculation method

MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.025 mg/m ³	0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.025 mg/m ³	0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.017
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	1.04 mg/m ³	0.717
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.076 mg/kg bw/day	0.059
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.777
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.74

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Products such as pH-regulators, flocculants, precipitants, neutralisation agents
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Process category(ies) PROC0 - Other Process
 PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC7 - Industrial spraying
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC13 - Treatment of articles by dipping and pouring
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents
Sector(s) of use SU0 - Other SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU13 - Manufacture of other non-metallic mineral products

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Amounts used

Type	Daily amount per site
Value	<= 1500
Units	kg/d

Type	Annual amount per site
Value	<= 150
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Solid, high dustiness
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	1000 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC0 - Other Process
Covers concentrations up to	5%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out operation for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0 mg/l	< 0.01
Soil	0.147 mg/kg dw	0.026

Derived No Effect Level (DNEL):

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	1 mg/m ³	0.69
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.02
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.71
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC13 - Treatment of articles by	Worker - dermal, long-term -	0.887 mg/kg bw/day	0.013

dipping and pouring	systemic		
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.101
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	0.15 mg/kg bw/day	< 0.01
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.09
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769
PROC0 - Other Process	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC0 - Other Process	Worker - dermal, long-term - systemic	0.186 mg/kg bw/day	< 0.01
PROC0 - Other Process	Worker - combined, long-term - systemic		0.083
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Laboratory chemicals Manufacture of bulk, large scale chemicals (including petroleum products)

Type Worker

Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category(ies) ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery

Product category(ies) PC21 - Laboratory chemicals

Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Amounts used

Type	Daily amount per site
Value	<= 250
Units	kg/d

Type	Annual amount per site
Value	<= 25
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness

Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Local exhaust ventilation - efficiency of at least 90% General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	500 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
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Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.301 mg/l	0.104
Marine water	0.03 mg/l	0.01
STP: Sewage Treatment Plant	2.499 mg/l	0.25
Soil	0.162 mg/kg dw	0.028

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01

PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.67 mg/m ³	0.462
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	20.38 mg/kg bw/day	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.518 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.225
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.379 mg/m ³	0.261
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.262

exposure			
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
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 6 Mid Point Business Park
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 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Laboratory chemicals Manufacture of fine chemicals
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6b - Industrial use of reactive processing aids ERC6c - Industrial use of monomers for manufacture of thermoplastics
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC21 - Laboratory chemicals
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU9 - Manufacture of fine chemicals

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids
 - ERC6c - Industrial use of monomers for manufacture of thermoplastics

Amounts used

Type	Daily amount per site
Value	<= 250
Units	kg/d

Type	Annual amount per site
Value	<= 25
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Local exhaust ventilation - efficiency of at least 90% General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent	Clean equipment and the work area every day

/limit releases, dispersion and exposure	
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	500 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

**Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids
- ERC6c - Industrial use of monomers for manufacture of thermoplastics**

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.676 mg/l	0.233
Marine water	0.068 mg/l	0.023
STP: Sewage Treatment Plant	6.248 mg/l	0.625
Soil	0.18 mg/kg dw	0.032

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.67 mg/m ³	0.462
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	20.38 mg/kg bw/day	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.518 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.225
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.379 mg/m ³	0.261
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.262
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769
PROC9 - Transfer of substance or preparation into small containers	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01

(dedicated filling line, including weighing)			
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
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 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title paint and Coatings
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC5 - Industrial use resulting in inclusion into or onto a matrix
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC7 - Industrial spraying
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC10 - Roller application or brushing
 PROC13 - Treatment of articles by dipping and pouring
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC9a - Coatings and paints, thinners, paint removers PC18 - Ink and toners
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU7 - Printing and reproduction of recorded media SU19 - Building and construction work

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Amounts used

Type	Daily amount per site
Value	<= 250
Units	kg/d

Type	Annual amount per site
Value	<= 50
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	<= 5%
Physical form of product	Liquid

Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	<= 5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	<= 5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Fill containers/cans at dedicated fill points supplied with local extract ventilation Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	<= 5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent	Clean equipment and the work area every day

/limit releases, dispersion and exposure	
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	<= 5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C
Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	<= 5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0 mg/l	< 0.01
Soil	0.147 mg/kg dw	0.026

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio

			(RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.088
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.334 mg/m ³	0.23
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	5.401 mg/kg bw/day	0.079
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.309
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	0.3 mg/kg bw/day	< 0.01
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.179
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.025 mg/m ³	0.017
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.02
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.007 mg/m ³	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.15 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Building and construction work
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC5 - Industrial use resulting in inclusion into or onto a matrix
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC21 - Low energy manipulation of substances bound in materials and/or articles
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products PC8 - Biocidal Products (e.g. disinfectants, pest control)
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU19 - Building and construction work

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Amounts used

Type	Daily amount per site
Value	<= 280
Units	kg/d

Type	Annual amount per site
Value	<= 28
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
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Covers concentrations up to	1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	1%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and	Clean equipment and the work area every day

exposure	
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.051 mg/l	0.018	
Marine water	0.00508 mg/l	< 0.01	
STP: Sewage Treatment Plant	0 mg/l	< 0.01	
Soil	0.147 mg/kg dw	0.026	

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.041 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC28 - Manual maintenance	Worker - dermal, long-term -	0.249 mg/kg bw/day	< 0.01

(cleaning and repair) of machinery	systemic		
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.084

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Manufacture of other non-metallic mineral products
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Process category(ies) PROC0 - Other Process
 PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU13 - Manufacture of other non-metallic mineral products

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Amounts used

Type	Daily amount per site
Value	<= 1000
Units	kg/d

Type	Annual amount per site
Value	<= 300
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	>= 2000 me/day
Sludge treatment	No application of sewage sludge to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to
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	vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	1000 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC0 - Other Process
Covers concentrations up to	5%
Physical form of product	Solid, low dustiness

Exposure duration	Avoid carrying out operation for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
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Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0 mg/l	< 0.01
Soil	0.147 mg/kg dw	0.026

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733

PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.998 mg/m ³	0.688
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769
PROC0 - Other Process	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC0 - Other Process	Worker - dermal, long-term - systemic	0.186 mg/kg bw/day	< 0.01
PROC0 - Other Process	Worker - combined, long-term - systemic		0.083
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Lubricants, greases, release products
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
 ERC7 - Industrial use of substances in closed systems
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC16 - Heat transfer fluids PC17 - Hydraulic fluids PC24 - Lubricants, greases, release products
Sector(s) of use SU0 - Other SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
 - ERC7 - Industrial use of substances in closed systems

Amounts used

Type	Daily amount per site
Value	<= 20000
Units	kg/d

Type	Annual amount per site
Value	<= 400
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day
Sludge treatment	No application of sewage sludge to soil

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	25%
Physical form of product	Liquid

Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

- ERC7 - Industrial use of substances in closed systems

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0.0000002 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio

			(RCR)
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.008 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.031 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.046 mg/m ³	0.032
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.248 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.035
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.008 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.021 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.008 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.031 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.002 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.002 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.208 mg/m ³	0.143
PROC28 - Manual maintenance	Worker - dermal, long-term - systemic	4.487 mg/kg bw/day	0.065

(cleaning and repair) of machinery	systemic		
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.209
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Lubricants, greases, release products (open systems)
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC7 - Industrial spraying
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC10 - Roller application or brushing
 PROC13 - Treatment of articles by dipping and pouring
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC24 - Lubricants, greases, release products
Sector(s) of use SU0 - Other SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Amounts used

Type	Daily amount per site
Value	<= 20000
Units	kg/d

Type	Annual amount per site
Value	<= 400
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day
Sludge treatment	No application of sewage sludge to soil

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	25%
Physical form of product	Liquid

Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 95% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and	Clean equipment and the work area every day

exposure	
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Calculation method

Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0.0000002 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.015 mg/m ³	0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.083 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.012
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.015 mg/m ³	0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.008 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.01

dedicated facilities			
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.006 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		< 0.01
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.759 mg/m ³	0.523
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	0.9 mg/kg bw/day	0.013
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.537
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.076 mg/m ³	0.052
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	0.09 mg/kg bw/day	< 0.01
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.054
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.655 mg/m ³	0.452
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	9.002 mg/kg bw/day	0.131
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.583
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.076 mg/m ³	0.052
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.532 mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.06
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.046 mg/m ³	0.032
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.248 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.035
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.208 mg/m ³	0.143
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	4.487 mg/kg bw/day	0.065
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.309
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Greasing at high energy conditions (open systems)
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC17 - Lubrication at high energy conditions and in partly open process
 PROC18 - Greasing at high energy conditions
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC24 - Lubricants, greases, release products PC25 - Metal working fluids
Sector(s) of use SU0 - Other SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Amounts used

Type	Daily amount per site
Value	<= 20000
Units	kg/d

Type	Annual amount per site
Value	<= 400
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day
Sludge treatment	No application of sewage sludge to soil

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Local exhaust ventilation - efficiency of at least 78%
Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Local exhaust ventilation - efficiency of at least 78%
Process category(ies)	PROC18 - Greasing at high energy conditions
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached)

the worker	Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	200 C

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Local exhaust ventilation - efficiency of at least 78%

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached)

the worker	Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0.0000002 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.046 mg/m ³	0.032
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.248 mg/kg bw/day	< 0.01

PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.035
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	0.7 mg/m ³	0.483
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	0.012 mg/kg bw/day	< 0.01
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.483
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	0.7 mg/m ³	0.483
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	0.012 mg/kg bw/day	< 0.01
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.483
PROC18 - Greasing at high energy conditions	Worker - inhalative, long-term - systemic	0.759 mg/m ³	0.523
PROC18 - Greasing at high energy conditions	Worker - dermal, long-term - systemic	0.819 mg/kg bw/day	0.012
PROC18 - Greasing at high energy conditions	Worker - combined, long-term - systemic		0.535
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.228 mg/m ³	0.157
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.021 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.158
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	0.7 mg/m ³	0.483
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	0.01 mg/kg bw/day	< 0.01
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.483
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.046 mg/m ³	0.032
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.248 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.035
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.208 mg/m ³	0.143
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	4.487 mg/kg bw/day	0.065
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.209
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01

PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Leather treatment products Manufacture of textiles, leather, fur
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6b - Industrial use of reactive processing aids
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC10 - Roller application or brushing
 PROC13 - Treatment of articles by dipping and pouring
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC23 - Leather tanning, dye, finishing, impregnation and care products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU5 - Manufacture of textiles, leather, fur

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Daily amount per site
Value	<= 2597
Units	kg/d

Type	Annual amount per site
Value	<= 200
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day
Sludge treatment	No application of sewage sludge to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%

Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	55 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Calculation method		Used EUSES model
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.061 mg/l	0.021
Marine water	0.00599 mg/l	< 0.01
STP: Sewage Treatment Plant	0.091 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.005 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.177 mg/m ³	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.177
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.177 mg/m ³	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.177
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.063 mg/m ³	0.043
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.045
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non	Worker - dermal, long-term - systemic	0.035 mg/m ³	< 0.01

dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.088
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.108 mg/m ³	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.176
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	0.3 mg/m ³	< 0.01
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.179
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/m ³	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.069 mg/m ³	0.048
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.496 mg/m ³	0.022
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.069

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Agriculture, forestry, fishery Offshore industries
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC5 - Industrial use resulting in inclusion into or onto a matrix
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC7 - Industrial spraying
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC13 - Treatment of articles by dipping and pouring
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products
Sector(s) of use SU1 - Agriculture, forestry, fishery SU2b - Offshore industries SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Amounts used

Type	Daily amount per site
Value	<= 10000
Units	kg/d

Type	Annual amount per site
Value	<= 200
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to
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	vessels/large containers at non dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Automate activity where possible Use with local exhaust ventilation Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%

Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.551 mg/l	0.19	
Marine water	0.055 mg/l	0.019	
STP: Sewage Treatment Plant	4.998 mg/l	0.5	
Soil	0.178 mg/kg dw	0.031	

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.038 mg/m ³	0.026
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - dermal, long-term - systemic	0.106 mg/kg bw/day	< 0.01

from/to vessels/large containers at non dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.028
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.03 mg/m ³	0.021
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.106 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.022
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.008 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.021 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.007 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.021 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	1.089 mg/m ³	0.751
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	0.54 mg/kg bw/day	< 0.01
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.759
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.076 mg/m ³	0.052
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.532mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.06
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01

process with occasional controlled exposure	systemic		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.069 mg/m ³	0.048
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.496 mg/kg bw/day	0.022
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.069

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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 Bradford
 GBR

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Section 1 - Title

Title Base metals and alloys Manufacture of basic metals, including alloys
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC5 - Industrial use resulting in inclusion into or onto a matrix
Process category(ies) PROC0 - Other Process
 PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC7 - Base metals and alloys
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU14 - Manufacture of basic metals, including alloys

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Amounts used

Type	Daily amount per site
Value	<= 909
Units	kg/d

Type	Annual amount per site
Value	<= 200
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day
Sludge treatment	No application of sewage sludge to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Local exhaust ventilation - efficiency of at least 90% General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Assumes process temperature up to	1000 C
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Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Process category(ies)	PROC0 - Other Process
Covers concentrations up to	5%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
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Section 3 - Exposure estimation

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.279 mg/l	0.096
Marine water	0.028 mg/l	< 0.01
STP: Sewage Treatment Plant	2.272 mg/l	0.227
Soil	0.144 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method Used ART model
MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous	Worker - dermal, long-term -	0.035 mg/kg bw/day	< 0.01

process with occasional controlled exposure	systemic		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.67 mg/m ³	0.462
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	20.38 mg/kg bw/day	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.518 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.225
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.492 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769
PROC0 - Other Process	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC0 - Other Process	Worker - dermal, long-term - systemic	0.186 mg/kg bw/day	< 0.01
PROC0 - Other Process	Worker - combined, long-term - systemic		0.083
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers	Worker - combined, long-term - systemic		0.01

(dedicated filling line, including weighing)			
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Base metals and alloys Manufacture of basic metals, including alloys
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6b - Industrial use of reactive processing aids
Process category(ies) PROC0 - Other Process
 PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC7 - Base metals and alloys
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU14 - Manufacture of basic metals, including alloys

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Daily amount per site
Value	<= 10000
Units	kg/d

Type	Annual amount per site
Value	<= 200
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and	Clean equipment and the work area every day

exposure	
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	1000 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Process category(ies)	PROC0 - Other Process
Covers concentrations up to	5%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Mechanical ventilation giving at least 1 ACH

the worker	
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.551 mg/l	0.19
Marine water	0.055 mg/l	0.019
STP: Sewage Treatment Plant	4.998 mg/l	0.5
Soil	0.173 mg/kg dw	0.03

Derived No Effect Level (DNEL):

Calculation method Used ART model
MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.011 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.67 mg/m ³	0.462
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	20.38 mg/kg bw/day	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	1.092 mg/m ³	0.753
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.273 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.757
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.518 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.225
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.492 mg/kg bw/day	0.036
PROC28 - Manual maintenance	Worker - combined, long-term		0.769

(cleaning and repair) of machinery	- systemic		
PROC0 - Other Process	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC0 - Other Process	Worker - dermal, long-term - systemic	0.186 mg/kg bw/day	< 0.01
PROC0 - Other Process	Worker - combined, long-term - systemic		0.083
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Welding and soldering products, flux products Manufacture of fabricated metal products, except machinery and equipment

Type Worker

Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental release category(ies) ERC5 - Industrial use resulting in inclusion into or onto a matrix

Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC28 - Manual maintenance (cleaning and repair) of machinery

Product category(ies) PC38 - Welding and soldering products, flux products

Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU15 - Manufacture of fabricated metal products, except machinery and equipment

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Amounts used

Type	Daily amount per site
Value	<= 909
Units	kg/d

Type	Annual amount per site
Value	<= 200
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	2000 m3/day
Sludge treatment	No application of sewage sludge to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour

ES00392 - Borates - Use at industrial sites; Welding and soldering products, flux products (PC 38); Manufacture of fabricated metal products, except machinery and equipment (SU 15) .

Revision date 09-Feb-2025

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.279 mg/l	0.096	
Marine water	0.028 mg/l	< 0.01	
STP: Sewage Treatment Plant	2.272 mg/l	0.227	
Soil	0.144 mg/kg dw	0.025	

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.355 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.093
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01

exposure			
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.05 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Welding and soldering products, flux products
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
 ERC6b - Industrial use of reactive processing aids
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC25 - Other hot work operations with metals
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC38 - Welding and soldering products, flux products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU14 - Manufacture of basic metals, including alloys
 SU15 - Manufacture of fabricated metal products, except machinery and equipment
 SU17 - General manufacturing
 SU19 - Building and construction work

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
 - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Daily amount per site
Value	<= 10000
Units	kg/d

Type	Annual amount per site
Value	<= 20
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C
Process category(ies)	PROC25 - Other hot work operations with metals
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C
Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

- ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.051 mg/l	0.018	
Marine water	0.00508 mg/l	< 0.01	
STP: Sewage Treatment Plant	0 mg/l	< 0.01	
Soil	0.146 mg/kg dw	0.026	

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.028 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC25 - Other hot work operations with metals	Worker - inhalative, long-term - systemic	0.506 mg/m ³	0.349
PROC25 - Other hot work operations with metals	Worker - dermal, long-term - systemic	0.273 mg/kg bw/day	< 0.01
PROC25 - Other hot work operations	Worker - combined, long-term		0.353

with metals	- systemic		
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.231 mg/m ³	0.159
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.167

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Metal surface treatment
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC5 - Industrial use resulting in inclusion into or onto a matrix
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC7 - Industrial spraying
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC10 - Roller application or brushing
 PROC13 - Treatment of articles by dipping and pouring
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC14 - Metal surface treatment products, including galvanic and electroplating products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU14 - Manufacture of basic metals, including alloys SU17 - General manufacturing

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Amounts used

Type	Annual amount per site
Value	<= 909
Units	kg/d

Type	Daily amount per site
Value	<= 200
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day
Sludge treatment	No application of sewage sludge to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
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Covers concentrations up to	25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	< 1%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	60 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Use with local exhaust ventilation Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Use with local exhaust ventilation Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.279 mg/l	0.096
Marine water	0.028 mg/l	< 0.01
STP: Sewage Treatment Plant	2.272 mg/l	0.227
Soil	0.144 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.759 mg/m ³	0.523
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.164 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.526
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.076 mg/m ³	0.052
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.021 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.053
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.759 mg/m ³	0.523
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.164 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.526
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.076 mg/m ³	0.052
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.164 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.055
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.089 mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.089
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.251 mg/m ³	0.173
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	5.401 mg/kg bw/day	0.079
PROC7 - Industrial spraying	Worker - combined, long-term		0.252

	- systemic		
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.754 mg/m ³	0.52
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	16.20 mg/kg bw/day	0.236
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.756
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.419 mg/m ³	0.289
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	0.54 mg/kg bw/day	< 0.01
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.297
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.698 mg/m ³	0.481
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	0.9 mg/kg bw/day	0.013
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.494
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.05 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Base metals and alloys Manufacture of basic metals, including alloys
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6b - Industrial use of reactive processing aids
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC7 - Base metals and alloys
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU14 - Manufacture of basic metals, including alloys

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Daily amount per site
Value	<= 5000
Units	kg/d

Type	Annual amount per site
Value	<= 100
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
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Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	5%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	5%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.676 mg/l	0.233
Marine water	0.068 mg/l	0.023
STP: Sewage Treatment Plant	6.248 mg/l	0.625
Soil	0.18 mg/kg dw	0.032

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.25 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.737
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.998 mg/m ³	0.688
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.25 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.692
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.007 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.021 mg/kg bw/day	< 0.01

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.324 mg/kg bw/day	< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.738
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	0.998 mg/m ³	0.688
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.324 mg/kg bw/day	< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.693
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
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Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

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Section 1 - Title

Title Manufacture of other non-metallic mineral products
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Process category(ies) PROC0 - Other Process
 PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU13 - Manufacture of other non-metallic mineral products

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Amounts used

Type	Daily amount per site
Value	<= 1000
Units	kg/d

Type	Annual amount per site
Value	<= 20
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
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Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Local exhaust ventilation - efficiency of at least 90% General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	1000 C

Process category(ies)	PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC0 - Other Process
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Covers concentrations up to	5%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.051 mg/l	0.018	
Marine water	0.00508 mg/l	< 0.01	
STP: Sewage Treatment Plant	0 mg/l	< 0.01	
Soil	0.147 mg/kg dw	0.026	

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297

PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.35 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		<0.014
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.67 mg/m ³	0.462
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	20.38 mg/kg bw/day	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.518 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.225
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC24 - High (mechanical) energy	Worker - dermal, long-term -	0.014 mg/kg bw/day	< 0.01

work-up of substances bound in materials and/or articles	systemic		
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - combined, long-term - systemic		0.088
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.632 mg/m ³	0.436
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.365 mg/kg bw/day	0.02
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.456
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01
PROC0 - Other Process	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC0 - Other Process	Worker - dermal, long-term - systemic	0.186 mg/kg bw/day	< 0.01
PROC0 - Other Process	Worker - combined, long-term - systemic		0.083
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.492 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Water treatment chemicals Electricity, steam, gas water supply and sewage treatment
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
 ERC6b - Industrial use of reactive processing aids
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC37 - Water treatment chemicals
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU23 - Recycling

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
 - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Daily amount per site
Value	<= 15000
Units	kg/d

Type	Annual amount per site
Value	<= 300
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Solid, medium dustiness

Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Local exhaust ventilation - efficiency of at least 90% General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	500 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

- ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0 mg/l	< 0.01
Soil	0.142 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01

PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.35 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		<0.014
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.67 mg/m ³	0.462
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	20.38 mg/kg bw/day	0.297
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.759
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.518 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.225
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.633 mg/m ³	0.437
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	8.19 mg/kg bw/day	0.119
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.556
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.379 mg/m ³	0.261
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.262
PROC28 - Manual maintenance	Worker - inhalative, long-term	1.063 mg/m ³	0.733

(cleaning and repair) of machinery	- systemic		
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Offshore industries
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6b - Industrial use of reactive processing aids
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU2b - Offshore industries

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Daily amount per site
Value	<= 1000
Units	kg/d

Type	Annual amount per site
Value	<= 20
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness or Paste
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	500 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
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Covers concentrations up to	> 25%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0 mg/l	< 0.01
Soil	0.146 mg/kg dw	0.026

Derived No Effect Level (DNEL):

Calculation method Used ART model
MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.297
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.457 mg/kg bw/day	0.036
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.332
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous	Worker - dermal, long-term -	0.35 mg/kg bw/day	< 0.01

process with occasional controlled exposure	systemic		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		<0.014
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.379 mg/m ³	0.261
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.262
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
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 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Photo-chemicals Printing and reproduction of recorded media
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC13 - Treatment of articles by dipping and pouring
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC30 - Photo-chemicals
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU7
 - Printing and reproduction of recorded media

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Amounts used

Type	Daily amount per site
Value	<= 1000
Units	kg/d

Type	Annual amount per site
Value	<= 20
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible

	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	< 1%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	< 1%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

**Predicted No Effect Concentration
(PNEC)**

Calculation method

Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.151 mg/l	0.052
Marine water	0.015 mg/l	< 0.01
STP: Sewage Treatment Plant	1 mg/l	0.1
Soil	0.147 mg/kg dw	0.026

Derived No Effect Level (DNEL):

Calculation method

Used ART model
MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.74
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.088
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.025 mg/m ³	0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity	Worker - inhalative, long-term - systemic	0.633 mg/m ³	0.437

for exposure arises			
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.439
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	0.633 mg/m ³	0.437
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.439
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.063 mg/m ³	0.043
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.046
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.063 mg/m ³	0.043
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.089 mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.045
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.023 mg/m ³	0.016
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.024
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.74

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
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 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Paper and board treatment products Printing and reproduction of recorded media
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC5 - Industrial use resulting in inclusion into or onto a matrix
Specific Environmental Release Category CEPE SPERC 5.1a.v1
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC26 - Paper and board dye, finishing and impregnation products; including bleaches and other processing aids
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU7 - Printing and reproduction of recorded media

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix
Specific Environmental Release Category - CEPE SPERC 5.1a.v1

Amounts used

Type	Daily amount per site
Value	<= 100
Units	kg/d

Type	Annual amount per site
Value	<= 20
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
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Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Automate activity where possible Use with local exhaust ventilation Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Indoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix
Specific Environmental Release Category - CEPE SPERC 5.1a.v1

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.051 mg/l	0.018	
Marine water	0.00508 mg/l	< 0.01	
STP: Sewage Treatment Plant	0 mg/l	< 0.01	
Soil	0.144 mg/kg dw	0.025	

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.316 mg/m ³	0.218
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.887 mg/kg bw/day	0.013
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - combined, long-term - systemic		0.231

from/to vessels/large containers at non dedicated facilities			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	0.835 mg/m ³	0.576
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.887 mg/kg bw/day	0.013
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.589
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.116

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Non-metal-surface treatment products Manufacture of basic metals, including alloys
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6b - Industrial use of reactive processing aids
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC7 - Industrial spraying
 PROC23 - Open processing and transfer operations with minerals/metals at elevated temperature
Product category(ies) PC15 - Non-metal-surface treatment products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU14 - Manufacture of basic metals, including alloys

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Daily amount per site
Value	<= 10000
Units	kg/d

Type	Annual amount per site
Value	<= 200
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%

Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	1000 C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	1%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Ensure that spray direction is only horizontal or downward Surface spraying with no or low compressed air use Low application rate (0.03 - 0.3 l/minute) Surface spraying of liquids Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor

Process category(ies)	PROC23 - Open processing and transfer operations with minerals/metals at elevated temperature
Covers concentrations up to	< 1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	1000 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.551 mg/l	0.19
Marine water	0.055 mg/l	0.019
STP: Sewage Treatment Plant	4.998 mg/l	0.5
Soil	0.173 mg/kg dw	0.03

Derived No Effect Level (DNEL):

Calculation method	Used ART model MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.03 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.175
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.42 mg/m ³	0.29
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	7.501 mg/kg bw/day	0.109
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.399
PROC23 - Open processing and transfer operations with minerals/metals at elevated temperature	Worker - inhalative, long-term - systemic	0.19 mg/m ³	0.131
PROC23 - Open processing and transfer operations with	Worker - dermal, long-term - systemic	0.102 mg/kg bw/day	< 0.01

minerals/metals at elevated temperature			
PROC23 - Open processing and transfer operations with minerals/metals at elevated temperature	Worker - combined, long-term - systemic		0.133

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Adhesives, sealants
Type article
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC12a - Industrial processing of articles with abrasive techniques (low release)
Process category(ies) PROC21 - Low energy manipulation of substances bound in materials and/or articles
Article categories AC2 - Machinery, mechanical appliances, electrical/electronic articles AC8 - Paper articles
 AC11 - Wood articles
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Amounts used

Type	Daily amount per site
Value	<= 500
Units	kg/d

Type	Annual amount per site
Value	<= 40
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached)

the worker	Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.676 mg/l	0.233
Marine water	0.068 mg/l	0.023
STP: Sewage Treatment Plant	6.248 mg/l	0.625
Soil	0.185 mg/kg dw	0.033

Derived No Effect Level (DNEL):

Calculation method MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01

PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Building and construction work
Type article
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC12a - Industrial processing of articles with abrasive techniques (low release)
Process category(ies) PROC21 - Low energy manipulation of substances bound in materials and/or articles
Article categories AC4 - Stone, plaster, cement, glass and ceramic articles
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Amounts used

Type	Daily amount per site
Value	<= 400
Units	kg/d

Type	Annual amount per site
Value	<= 20
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible

	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.551 mg/l	0.19
Marine water	0.055 mg/l	0.019
STP: Sewage Treatment Plant	4.998 mg/l	0.5
Soil	0.175 mg/kg dw	0.031

Derived No Effect Level (DNEL):

Calculation method MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title paint and Coatings
Type article
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC12a - Industrial processing of articles with abrasive techniques (low release)
Process category(ies) PROC21 - Low energy manipulation of substances bound in materials and/or articles
 PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Article categories AC7a - Metal products: cutlery, cooking utensils, pots, pans AC8 - Paper articles
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Amounts used

Type	Daily amount per site
Value	<= 500
Units	kg/d

Type	Annual amount per site
Value	<= 25
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once

control dispersion from source towards the worker	a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Predicted No Effect Concentration (PNEC)

Calculation method

Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.676 mg/l	0.233
Marine water	0.068 mg/l	0.023
STP: Sewage Treatment Plant	6.248 mg/l	0.625
Soil	0.183 mg/kg dw	0.032

Derived No Effect Level (DNEL):

Calculation method

MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.191 mg/m ³	0.132
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	1.496 mg/kg bw/day	0.022
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - combined, long-term - systemic		0.154
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.197 mg/m ³	0.136
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	1.638 mg/kg bw/day	0.024
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - combined, long-term - systemic		0.16

Section 4 - Guidance to check compliance with the exposure scenario

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Section 1 - Title

Title Building and construction work
Type article
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC12a - Industrial processing of articles with abrasive techniques (low release)
Process category(ies) PROC21 - Low energy manipulation of substances bound in materials and/or articles
Article categories AC4 - Stone, plaster, cement, glass and ceramic articles AC11a - Wood and wood furniture: furniture
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Amounts used

Type	Daily amount per site
Value	<= 500
Units	kg/d

Type	Annual amount per site
Value	<= 30
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached)

the worker	Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.676 mg/l	0.233
Marine water	0.068 mg/l	0.023
STP: Sewage Treatment Plant	6.248 mg/l	0.625
Soil	0.184 mg/kg dw	0.032

Derived No Effect Level (DNEL):

Calculation method MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01

PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Agriculture, forestry, fishery Offshore industries
Type article
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC12a - Industrial processing of articles with abrasive techniques (low release)
Process category(ies) PROC21 - Low energy manipulation of substances bound in materials and/or articles
Article categories AC5 - Fabrics, textiles and apparel
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Amounts used

Type	Daily amount per site
Value	<= 500
Units	kg/d

Type	Annual amount per site
Value	<= 30
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible

	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.676 mg/l	0.233
Marine water	0.068 mg/l	0.023
STP: Sewage Treatment Plant	6.248 mg/l	0.625
Soil	0.184 mg/kg dw	0.032

Derived No Effect Level (DNEL):

Calculation method MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01

PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Metal articles
Type article
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC12a - Industrial processing of articles with abrasive techniques (low release)
Process category(ies) PROC21 - Low energy manipulation of substances bound in materials and/or articles
Article categories AC7 - Metal articles
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Amounts used

Type	Daily amount per site
Value	<= 1852
Units	kg/d

Type	Annual amount per site
Value	<= 400
Units	t(ons)/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Assumed domestic sewage treatment plant flow	>= 2000 m3/day

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/day
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	< 1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	< 1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC12a - Industrial processing of articles with abrasive techniques (low release)

Predicted No Effect Concentration (PNEC)

Calculation method

Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.054 mg/l	0.019
Marine water	0.00536 mg/l	< 0.01
STP: Sewage Treatment Plant	0.028 mg/l	< 0.01
Soil	0.142 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method

MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01

articles			
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Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Manufacture of fabricated metal products, except machinery and equipment
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products
Sector(s) of use SU15 - Manufacture of fabricated metal products, except machinery and equipment SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
 - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C
Process category(ies)	PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Process category(ies)	PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Wet cleaning of the workplace Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Wet cleaning of the workplace Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.052 mg/L	0.018	
Marine water	0.00511 mg/L	< 0.01	
STP: Sewage Treatment Plant	0.00275 mg/L	< 0.01	
Soil	0.141 mg/kg dw	0.025	

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.028 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.228 mg/m ³	0.157
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	4.914 mg/kg bw/day	0.072
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - combined, long-term - systemic		0.229
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.197 mg/m ³	0.136
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	1.638 mg/kg bw/day	0.024
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - combined, long-term - systemic		0.16
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.231 mg/m ³	0.159
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.167
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.997 mg/m ³	0.688
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.695

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Fertilisers Agriculture, forestry, fishery
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC7 - Industrial spraying
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC11 - Non industrial spraying
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC12 - Fertilisers
Sector(s) of use SU1 - Agriculture, forestry, fishery SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
 - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
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Covers concentrations up to	5%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Use in semi-automated and predominantly enclosed filling lines

the worker	
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	5%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 95% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 Wear a respirator providing a minimum efficiency of 95% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Automated task Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Automated task
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Indoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Indoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.134 mg/L	0.046
Marine water	0.013 mg/L	< 0.01
STP: Sewage Treatment Plant	0.825 mg/L	0.082
Soil	0.146 mg/kg dw	0.026

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.008 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.021 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.007 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.021 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733

PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.74
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	1.093 mg/m ³	0.754
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.546 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.762
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	0.983 mg/m ³	0.678
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	8.19 mg/kg bw/day	0.119
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.797
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.001 mg/kg bw/day	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.001 mg/kg bw/day	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.007 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.062 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.328 mg/m ³	0.226
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.106 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - combined, long-term - systemic		0.228

from/to vessels/large containers at non dedicated facilities			
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.008 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.062 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.379 mg/m ³	0.261
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.106 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.263
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	0.983 mg/m ³	0.678
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	6.12 mg/kg bw/day	0.089
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.767
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.419 mg/m ³	0.289
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	0.54 mg/kg bw/day	< 0.01
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.297
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	0.655 mg/m ³	0.452
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	0.9 mg/kg bw/day	0.013
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.465
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.638 mg/m ³	0.44
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.196 mg/kg bw/day	0.017
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.457
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.599 mg/m ³	0.413
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.196 mg/kg bw/day	0.017
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.431
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.064 mg/m ³	0.044
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.196 mg/kg bw/day	0.017

PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.062
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.06 mg/m ³	0.041
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.196 mg/kg bw/day	0.017
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.059

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Laboratory chemicals Scientific research and development
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8b - Wide dispersive indoor use of reactive substances in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC21 - Laboratory chemicals
Sector(s) of use SU22 - Professional uses SU24 - Scientific research and development

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
 - ERC8b - Wide dispersive indoor use of reactive substances in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Wet cleaning of the workplace Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Mechanical ventilation giving at least 1 ACH

the worker	
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Wet cleaning of the workplace Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8b - Wide dispersive indoor use of reactive substances in open systems

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.053 mg/L	0.018
Marine water	0.00522 mg/L	< 0.01
STP: Sewage Treatment Plant	0.014 mg/L	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.032 mg/m ³	0.022
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.052 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.023
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC9 - Transfer of substance or	Worker - dermal, long-term -	0.104 mg/kg bw/day	< 0.01

preparation into small containers (dedicated filling line, including weighing)	systemic		
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.578 mg/m ³	0.399
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.246 mg/kg bw/day	0.018
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.417

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Building and construction work
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC11 - Non industrial spraying
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products
Sector(s) of use SU19 - Building and construction work SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix
 - ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 95% Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix - ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration

(PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.0051 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00247 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.007 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.025 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.025 mg/m ³	0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.017
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	1.04 mg/m ³	0.717
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	4.076 mg/kg bw/day	0.059
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.777
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.74

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title paint and Coatings
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC10 - Roller application or brushing
 PROC11 - Non industrial spraying
 PROC13 - Treatment of articles by dipping and pouring
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC9a - Coatings and paints, thinners, paint removers PC18 - Ink and toners
Sector(s) of use SU7 - Printing and reproduction of recorded media SU19 - Building and construction work
 SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix
 - ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent	Clean equipment and the work area every day

/limit releases, dispersion and exposure	
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C
Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 95% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Undertake operation under enclosed conditions

control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix - ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.397 mg/m ³	0.274
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.064 mg/kg bw/day	0.016

PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.289
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	0.956 mg/m ³	0.659
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	7.478 mg/kg bw/day	0.109
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.768
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.152 mg/m ³	0.105
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.8 mg/kg bw/day	0.026
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.131
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.09
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.116

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Building and construction work
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC21 - Low energy manipulation of substances bound in materials and/or articles
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products PC8 - Biocidal Products (e.g. disinfectants, pest control)
Sector(s) of use SU19 - Building and construction work SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix
 - ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	< 1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	< 1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	< 1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	< 1%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix - ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.0051 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00165 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.041 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.058 mg/m ³	0.04
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.125 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.042

Section 4 - Guidance to check compliance with the exposure scenario

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Section 1 - Title

Title Washing and cleaning products
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC19 - Hand-mixing with intimate contact and only PPE available
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC35 - Washing and cleaning products (including solvent based products)
Sector(s) of use SU0 - Other SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Further information

Operational conditions	Indoor/Outdoor use
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Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Product applied in aqueous process solution with negligible volatilisation Spent process fluid discharged to wastewater
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	< 1%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	< 1%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	< 1%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	90 C

Process category(ies)	PROC19 - Hand-mixing with intimate contact and only PPE available
Covers concentrations up to	< 1%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	< 1%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.055 mg/l	0.019
Marine water	0.00541 mg/l	< 0.01
STP: Sewage Treatment Plant	0.033 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.063 mg/m ³	0.043
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.046
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.038 mg/m ³	0.026
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.026
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - dermal, long-term - systemic	0.027 mg/kg bw/day	< 0.01
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.012 mg/m ³	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.249 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Lubricants, greases, release products
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC9a - Wide dispersive indoor use of substances in closed systems ERC9b - Wide dispersive outdoor use of substances in closed systems
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Product category(ies) PC16 - Heat transfer fluids PC17 - Hydraulic fluids PC24 - Lubricants, greases, release products
Sector(s) of use SU15 - Manufacture of fabricated metal products, except machinery and equipment SU17 - General manufacturing SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC9a - Wide dispersive indoor use of substances in closed systems
 - ERC9b - Wide dispersive outdoor use of substances in closed systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Control of worker exposure	
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and	Clean equipment and the work area every day

exposure	
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible

	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure operatives are trained to minimise exposures Ensure that direct skin contact is avoided
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure operatives are trained to minimise exposures Ensure that direct skin contact is avoided
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and	Clean equipment and the work area every day

exposure	
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in closed process Automated task
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC9a - Wide dispersive indoor use of substances in closed systems - ERC9b - Wide dispersive outdoor use of substances in closed systems

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00511 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00275 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio

			(RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.379 mg/m ³	0.261
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.064 mg/kg bw/day	0.016
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.277
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.328 mg/m ³	0.226
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.064 mg/kg bw/day	0.016
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.242
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.015 mg/m ³	0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.083 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.012
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.083 mg/kg bw/day	< 0.01
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01

PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - systemic	0.265 mg/m ³	0.183
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - dermal, long-term - systemic	0.0004 mg/kg bw/day	< 0.01
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - combined, long-term - systemic		0.183
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - systemic	0.265 mg/m ³	0.183
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - dermal, long-term - systemic	0.0004 mg/kg bw/day	< 0.01
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - combined, long-term - systemic		0.183
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.001 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.001 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Lubricants, greases, release products (open systems)
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC10 - Roller application or brushing
 PROC11 - Non industrial spraying
 PROC13 - Treatment of articles by dipping and pouring
Product category(ies) PC24 - Lubricants, greases, release products
Sector(s) of use SU15 - Manufacture of fabricated metal products, except machinery and equipment SU17 - General manufacturing SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
 - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/d
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Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Negligible wastewater emissions as process operates without water contact
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible

	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0.0000275 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or	Worker - combined, long-term		0.088

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	- systemic		
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	0.3 mg/kg bw/day	< 0.01
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.179
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.218 mg/m ³	0.15
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	0.3 mg/kg bw/day	< 0.01
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.155
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	0.759 mg/m ³	0.523
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	1.638 mg/kg bw/day	0.024
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.547
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	0.656 mg/m ³	0.452
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	1.638 mg/kg bw/day	0.024
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.476
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.177
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.379 mg/m ³	0.261
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.064 mg/kg bw/day	0.016
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.277
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01

PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
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Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
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 6 Mid Point Business Park
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Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Greasing at high energy conditions (open systems)
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC17 - Lubrication at high energy conditions and in partly open process
 PROC18 - Greasing at high energy conditions
Product category(ies) PC24 - Lubricants, greases, release products PC25 - Metal working fluids
Sector(s) of use SU15 - Manufacture of fabricated metal products, except machinery and equipment SU17 - General manufacturing SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Further information

Operational conditions	Indoor use
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Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	>= 18000 m3/d
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

personal protection, hygiene and health evaluation	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Indoor/Outdoor use	Indoor

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure operatives are trained to minimise exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC18 - Greasing at high energy conditions
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC18 - Greasing at high energy conditions
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible

	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0.000055 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.355 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging)	Worker - combined, long-term - systemic		0.093

from/to vessels/large containers at non dedicated facilities			
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	0.265 mg/m ³	0.183
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	0.004 mg/kg bw/day	< 0.01
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.183
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	0.265 mg/m ³	0.183
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	0.004 mg/kg bw/day	< 0.01
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.183
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	0.265 mg/m ³	0.183
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	0.004 mg/kg bw/day	< 0.01
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.183
PROC18 - Greasing at high energy conditions	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC18 - Greasing at high energy conditions	Worker - dermal, long-term - systemic	0.273 mg/kg bw/day	< 0.01
PROC18 - Greasing at high energy conditions	Worker - combined, long-term - systemic		0.178
PROC18 - Greasing at high energy conditions	Worker - inhalative, long-term - systemic	0.218 mg/m ³	0.15
PROC18 - Greasing at high energy conditions	Worker - dermal, long-term - systemic	0.273 mg/kg bw/day	< 0.01
PROC18 - Greasing at high energy conditions	Worker - combined, long-term - systemic		0.154
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.379 mg/m ³	0.261
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.064 mg/kg bw/day	0.016
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.277
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.328 mg/m ³	0.226
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.064 mg/kg bw/day	0.016
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.242
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous	Worker - dermal, long-term -	0.007 mg/kg bw/day	< 0.01

process with occasional controlled exposure	systemic		
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	BORATES
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Leather treatment products Manufacture of textiles, leather, fur
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8b - Wide dispersive indoor use of reactive substances in open systems
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies)	PC23 - Leather tanning, dye, finishing, impregnation and care products
Sector(s) of use	SU5 - Manufacture of textiles, leather, fur SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	55 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Mechanical ventilation giving at least 1 ACH

control dispersion from source towards the worker	
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%

Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00509 mg/l	< 0.01
STP: Sewage Treatment Plant	0.0011 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/m ³	< 0.01

PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.005 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.177 mg/m ³	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.177
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.177 mg/m ³	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.177
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.063 mg/m ³	0.043
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.104 mg/m ³	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.045
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.035 mg/m ³	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.088
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.177 mg/m ³	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.177
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	0.253 mg/m ³	0.174
PROC10 - Roller application or	Worker - dermal, long-term -	0.3 mg/m ³	< 0.01

brushing	systemic		
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.179
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.863 mg/m ³	0.027
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.76
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.069 mg/m ³	0.048
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.496 mg/m ³	0.022
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.069

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Agriculture, forestry, fishery Offshore industries
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC11 - Non industrial spraying
 PROC13 - Treatment of articles by dipping and pouring
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC0 - Other Products
Sector(s) of use SU1 - Agriculture, forestry, fishery SU2b - Offshore industries SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix
 - ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Indoor/Outdoor use	Indoor
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C
Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Undertake operation under enclosed conditions

control dispersion from source towards the worker	Ensure containment of the emission source Low application rate (0.03 - 0.3 l/minute) Ensure that spray direction is only horizontal or downward Surface spraying with no or low compressed air use General ventilation Efficiency of at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear suitable gloves tested to EN 374 See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Demonstrable and effective housekeeping practices are in place
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and	Clean equipment and the work area every day

exposure	
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C
Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix - ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.0051 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00165 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method Used ART model
MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.038 mg/m ³	0.026
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.106 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.028
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non	Worker - inhalative, long-term - systemic	0.033 mg/m ³	0.023

dedicated facilities			
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.106 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.024
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.008 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.021 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.007 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.021 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	0.83 mg/m ³	0.572
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	12.22 mg/kg bw/day	0.178
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.751
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.076 mg/m ³	0.052
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.532mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.06
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.069 mg/m ³	0.048
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	1.496 mg/kg bw/day	0.022

PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.069
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Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
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 6 Mid Point Business Park
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 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Welding and soldering products, flux products
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC25 - Other hot work operations with metals
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC38 - Welding and soldering products, flux products
Sector(s) of use SU14 - Manufacture of basic metals, including alloys SU15 - Manufacture of fabricated metal products, except machinery and equipment SU17 - General manufacturing SU19 - Building and construction work SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
 - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and	Clean equipment and the work area every day

exposure	
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Paste
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C
Process category(ies)	PROC25 - Other hot work operations with metals
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C
Process category(ies)	PROC25 - Other hot work operations with metals
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	900 C
Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.053 mg/l	0.018
Marine water	0.00522 mg/l	< 0.01
STP: Sewage Treatment Plant	0.014 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.088
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC25 - Other hot work operations with metals	Worker - inhalative, long-term - systemic	0.304 mg/m ³	0.21

PROC25 - Other hot work operations with metals	Worker - dermal, long-term - systemic	0.164 mg/kg bw/day	< 0.01
PROC25 - Other hot work operations with metals	Worker - combined, long-term - systemic		0.212
PROC25 - Other hot work operations with metals	Worker - inhalative, long-term - systemic	0.061 mg/m ³	0.042
PROC25 - Other hot work operations with metals	Worker - dermal, long-term - systemic	0.164 mg/kg bw/day	< 0.01
PROC25 - Other hot work operations with metals	Worker - combined, long-term - systemic		0.044
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.023 mg/m ³	0.016
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.023

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

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Section 1 - Title

Title Base metals and alloys Manufacture of basic metals, including alloys
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8b - Wide dispersive indoor use of reactive substances in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC7 - Base metals and alloys
Sector(s) of use SU14 - Manufacture of basic metals, including alloys SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to
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	vessels/large containers at non dedicated facilities
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	5%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	5%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Solid, medium dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0.000137 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.249 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.737
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	1.093 mg/m ³	0.754
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.273 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.758
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.324 mg/kg bw/day	< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.738
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	1.093 mg/m ³	0.754
PROC4 - Use in batch and other	Worker - dermal, long-term -	0.355 mg/kg bw/day	< 0.01

process (synthesis) where opportunity for exposure arises	systemic		
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.759
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.769

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Photo-chemicals Printing and reproduction of recorded media
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC13 - Treatment of articles by dipping and pouring
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC30 - Photo-chemicals
Sector(s) of use SU7 - Printing and reproduction of recorded media SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Use in semi-automated and predominantly enclosed filling lines

control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	5%
Physical form of product	Solid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00513 mg/l	< 0.01
STP: Sewage Treatment Plant	0.0055 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or	Worker - inhalative, long-term	1.063 mg/m ³	0.733

preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	- systemic		
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.74
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.088
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.025 mg/m ³	0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.007 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	0.633 mg/m ³	0.437
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.439
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	0.633 mg/m ³	0.437
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.177 mg/kg bw/day	< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.439
PROC9 - Transfer of substance or	Worker - inhalative, long-term	0.001 mg/m ³	< 0.01

preparation into small containers (dedicated filling line, including weighing)	- systemic		
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.001 mg/kg bw/day	< 0.01
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	0.152 mg/m ³	0.105
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	0.106 mg/kg bw/day	< 0.01
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.106
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.023 mg/m ³	0.016
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.024
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	1.063 mg/m ³	0.733
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.499 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.74

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Paper and board treatment products Printing and reproduction of recorded media
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC26 - Paper and board dye, finishing and impregnation products; including bleaches and other processing aids
Sector(s) of use SU7 - Printing and reproduction of recorded media SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Assumes process temperature up to	40 C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Covers indoor and outdoor use
Assumes process temperature up to	40 C

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	> 25%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Mechanical ventilation giving at least 1 ACH

the worker	
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Indoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.051 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0.000055 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.582 mg/m ³	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.774 mg/kg bw/day	0.026
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.427
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	0.582 mg/m ³	0.401
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	5.322 mg/kg bw/day	0.078

PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.479
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	0.013 mg/m ³	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.035 mg/kg bw/day	< 0.01
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	2.493 mg/kg bw/day	0.036
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.116

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
Supplier Univar Solutions UK Ltd
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 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Water treatment chemicals
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC26 - Handling of solid inorganic substances at ambient temperature
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC37 - Water treatment chemicals
Sector(s) of use SU0 - Other SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
 - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	< 1%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	< 1%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	< 1%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor
Assumes process temperature up to	40 C

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	< 1%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor
Assumes process temperature up to	40 C

Process category(ies)	PROC26 - Handling of solid inorganic substances at ambient temperature
Covers concentrations up to	< 1%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Mechanical ventilation giving at least 1 ACH

control dispersion from source towards the worker	
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC26 - Handling of solid inorganic substances at ambient temperature
Covers concentrations up to	< 1%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	< 1%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Indoor

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	< 1%
Physical form of product	Solid, low dustiness
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day Wet cleaning of the workplace
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method

Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00516 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00825 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method

MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.127 mg/m ³	0.088
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.273 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.092
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	0.109 mg/m ³	0.075
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.273 mg/kg bw/day	< 0.01
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.079
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.003 mg/kg bw/day	< 0.01
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		< 0.01

PROC26 - Handling of solid inorganic substances at ambient temperature	Worker - inhalative, long-term - systemic	0.006 mg/m ³	< 0.01
PROC26 - Handling of solid inorganic substances at ambient temperature	Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	< 0.01
PROC26 - Handling of solid inorganic substances at ambient temperature	Worker - combined, long-term - systemic		< 0.01
PROC26 - Handling of solid inorganic substances at ambient temperature	Worker - inhalative, long-term - systemic	0.005 mg/m ³	< 0.01
PROC26 - Handling of solid inorganic substances at ambient temperature	Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	< 0.01
PROC26 - Handling of solid inorganic substances at ambient temperature	Worker - combined, long-term - systemic		< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.116 mg/m ³	0.08
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.249 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.084
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - systemic	0.11 mg/m ³	0.069
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - dermal, long-term - systemic	0.249 mg/kg bw/day	< 0.01
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - combined, long-term - systemic		0.073

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name BORATES
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Building and construction work
Type article
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Process category(ies) PROC21 - Low energy manipulation of substances bound in materials and/or articles
Article categories AC4 - Stone, plaster, cement, glass and ceramic articles
Sector(s) of use SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release

- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00512 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00352 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	BORATES
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	paint and Coatings
Type	article
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Article categories	AC7a - Metal products: cutlery, cooking utensils, pots, pans AC8 - Paper articles
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%

Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Process category(ies)	PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines Mechanical ventilation giving at least 3 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Undertake operation under enclosed conditions Use in semi-automated and predominantly enclosed filling lines
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection Wear a respirator providing a minimum efficiency of 90% See Section 8 for information on appropriate personal protective equipment
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release

- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.0051 mg/l	< 0.01

STP: Sewage Treatment Plant	0.0022 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.191 mg/m ³	0.132
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	1.496 mg/kg bw/day	0.022
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - combined, long-term - systemic		0.154
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.197 mg/m ³	0.136
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	1.638 mg/kg bw/day	0.024
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles	Worker - combined, long-term - systemic		0.16

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Building and construction work
Type article
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Process category(ies) PROC21 - Low energy manipulation of substances bound in materials and/or articles
Article categories AC4 - Stone, plaster, cement, glass and ceramic articles AC11a - Wood and wood furniture:
 furniture
Sector(s) of use SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release

- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method

Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00511 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00264 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method

MEASE

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title	Agriculture, forestry, fishery Offshore industries
Type	article
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Article categories	AC5 - Fabrics, textiles and apparel
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	5%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Automate activity where possible
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release

- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00509 mg/l	< 0.01
STP: Sewage Treatment Plant	0.141 mg/l	0.025
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.003 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.002 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Metal articles
Type article
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Process category(ies) PROC21 - Low energy manipulation of substances bound in materials and/or articles
Article categories AC7 - Metal articles
Sector(s) of use SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	< 1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	< 1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release

- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.052 mg/l	0.018	
Marine water	0.00512 mg/l	< 0.01	
STP: Sewage Treatment Plant	0.00352 mg/l	< 0.01	
Soil	0.141 mg/kg dw	0.025	

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title	Paper articles
Type	article
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Article categories	AC8 - Paper articles
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure	
Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	< 1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Mechanical ventilation giving at least 1 ACH
Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Indoor

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	< 1%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Conditions and measures related to personal protection, hygiene and health evaluation	S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day
Indoor/Outdoor use	Outdoor

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release

- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.052 mg/l	0.018	
Marine water	0.00508 mg/l	< 0.01	
STP: Sewage Treatment Plant	0.000176 mg/l	< 0.01	
Soil	0.141 mg/kg dw	0.025	

Derived No Effect Level (DNEL):

Calculation method	MEASE		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - systemic	0.001 mg/m ³	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Manufacture of fabricated metal products, except machinery and equipment
Type Consumer
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Product category(ies) PC0 - Other Products
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
 - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of consumer exposure

Product categories [PC]	PC0 - Other Products
Covers concentrations up to	1.8%
Physical form of product	Solid, medium dustiness
Amounts used	1000 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
 - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018

Marine water	0.00509 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00137 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	Used ECETOC TRA model		
Product category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PC0 - Other Products	Consumer - inhalative, long-term - systemic	0.000025 mg/m ³	< 0.01
PC0 - Other Products	Consumer - dermal, long-term - systemic	26.25 mg/kg bw/day	0.765
PC0 - Other Products	Consumer - oral, long-term - systemic	0 mg/kg bw/day	< 0.01
PC0 - Other Products	Consumer - combined, long-term - systemic		0.765

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Adhesives, sealants
Type Consumer
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Product category(ies) PC1 - Adhesives, sealants
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix
 - ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Equipment cleaned with water, washing disposed of with wastewater. Worst case assumption for solvent-borne products
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Control measures to prevent releases

Remarks	Professional and consumer product use with limited or no technical control of emission
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of consumer exposure

Product categories [PC]	PC1 - Adhesives, sealants
Product (sub) category(ies)	Glues DIY-use (carpet glue, tile glue, wood parquet glue)
Covers concentrations up to	5.5%
Amounts used	1.5E4 g/event
Exposure duration	6 hours
Use frequency	1 events per day

Product categories [PC]	PC1 - Adhesives, sealants
Product (sub) category(ies)	Glues, hobby use
Covers concentrations up to	5.5%
Amounts used	9 g/event
Exposure duration	4 hours
Use frequency	1 events per day

Product categories [PC]	PC1 - Adhesives, sealants
Product (sub) category(ies)	Sealant
Covers concentrations up to	5.5%
Amounts used	390 g/event
Exposure duration	4 hours
Use frequency	1 events per day

Section 3 - Exposure estimation

**Environmental release category(ies) - ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix
- ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix**

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	
Freshwater	0.052 mg/l	0.018	
Marine water	0.00508 mg/l	< 0.01	
STP: Sewage Treatment Plant	0.000206 mg/l	< 0.01	
Soil	0.141 mg/kg dw	0.025	

Derived No Effect Level (DNEL):

Calculation method	Used ECETOC TRA model		
Product category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	0.000025 mg/m ³	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	3.931 mg/kg bw/day	0.115
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/day	< 0.01
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		0.115
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	0.000025 mg/m ³	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	0.327 mg/kg bw/day	< 0.01
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/day	< 0.01
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		< 0.01
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	0.000025 mg/m ³	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	0.327 mg/kg bw/day	< 0.01
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/day	< 0.01
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		< 0.01

Section 4 - Guidance to check compliance with the exposure scenario

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.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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Section 1 - Title

Title Fertilisers
Type Consumer
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Product category(ies) PC12 - Fertilisers
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
 - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of consumer exposure

Product categories [PC]	PC12 - Fertilisers
Covers concentrations up to	0.4%
Exposure duration	8 hours
Use frequency	1 events per day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
 - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.093 mg/l	0.032
Marine water	0.0092 mg/l	< 0.01
STP: Sewage Treatment Plant	0.412 mg/l	0.041

Soil	0.144 mg/kg dw	0.025
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Derived No Effect Level (DNEL):

Calculation method		Used ECETOC TRA model	
Product category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PC0 - Other Products	Consumer - inhalative, long-term - systemic	0 mg/m ³	< 0.01
PC0 - Other Products	Consumer - dermal, long-term - systemic	1.018 mg/kg bw/day	0.03
PC0 - Other Products	Consumer - oral, long-term - systemic	0.12 mg/kg bw/day	0.706
PC0 - Other Products	Consumer - combined, long-term - systemic		0.736

Section 4 - Guidance to check compliance with the exposure scenario

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Section 1 - Title

Title	Washing and cleaning products
Type	Consumer
Main user group	Consumer uses: Private households (= general public = consumers)
Environmental release category(ies)	ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems
Product category(ies)	PC35 - Washing and cleaning products (including solvent based products)
Sector(s) of use	SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Further information

Operational conditions	Indoor/Outdoor use
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Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Spent process fluid discharged to wastewater Product applied in aqueous process solution with negligible volatilisation
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of consumer exposure

Product categories [PC]	PC35 - Washing and cleaning products (including solvent based products)
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Product (sub) category(ies)	Laundry and dish washing products
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Covers concentrations up to	5.5%
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Amounts used	50 g/event
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Exposure duration	1 hours
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Use frequency	1 events per day
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Product categories [PC]	PC35 - Washing and cleaning products (including solvent based products)
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Product (sub) category(ies)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)
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Covers concentrations up to	5.5%
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Amounts used	250 g/event
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Exposure duration	0.33 hours
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Use frequency	1 events per day
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Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level		Risk characterisation ratio (RCR)
Freshwater	0.055 mg/l		0.019
Marine water	0.00541 mg/l		< 0.01
STP: Sewage Treatment Plant	0.033 mg/l		< 0.01
Soil	0.141 mg/kg dw		0.025

Derived No Effect Level (DNEL):

Calculation method	Used ECETOC TRA model		
Product category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PC35 - Washing and cleaning products (including solvent based products)	Consumer - inhalative, long-term - systemic	0.000025 mg/m ³	< 0.01
PC35 - Washing and cleaning products (including solvent based products)	Consumer - dermal, long-term - systemic	7.86 mg/kg bw/day	0.229
PC35 - Washing and cleaning products (including solvent based products)	Consumer - oral, long-term - systemic	0 mg/kg bw/day	< 0.01
PC35 - Washing and cleaning products (including solvent based products)	Consumer - combined, long-term - systemic		0.229
PC35 - Washing and cleaning products (including solvent based products)	Consumer - inhalative, long-term - systemic	0.000025 mg/m ³	< 0.01
PC35 - Washing and cleaning products (including solvent based products)	Consumer - dermal, long-term - systemic	7.86 mg/kg bw/day	0.229
PC35 - Washing and cleaning products (including solvent based products)	Consumer - oral, long-term - systemic	0 mg/kg bw/day	< 0.01
PC35 - Washing and cleaning products (including solvent based products)	Consumer - combined, long-term - systemic		0.229

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title	Lubricants, greases, release products
Type	Consumer
Main user group	Consumer uses: Private households (= general public = consumers)
Environmental release category(ies)	ERC9a - Wide dispersive indoor use of substances in closed systems ERC9b - Wide dispersive outdoor use of substances in closed systems
Product category(ies)	PC24 - Lubricants, greases, release products
Sector(s) of use	SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC9a - Wide dispersive indoor use of substances in closed systems
- ERC9b - Wide dispersive outdoor use of substances in closed systems

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of consumer exposure

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Liquids
Covers concentrations up to	5.5%
Amounts used	5000 g/event
Exposure duration	4 hours
Use frequency	1 events per day

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Pastes
Covers concentrations up to	5.5%
Exposure duration	8 hours
Use frequency	1 events per day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC9a - Wide dispersive indoor use of substances in closed systems
- ERC9b - Wide dispersive outdoor use of substances in closed systems

**Predicted No Effect Concentration
(PNEC)**

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00509 mg/l	< 0.01
STP: Sewage Treatment Plant	0.000687 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Calculation method	Used ECETOC TRA model		
Product category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	0.000025 mg/m ³	< 0.01
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	7.86 mg/kg bw/day	0.229
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/day	< 0.01
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		0.229
PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	0 mg/m ³	< 0.01
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	7.86 mg/kg bw/day	0.229
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/day	< 0.01
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		0.229

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Adhesives, sealants
Type article
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Article categories AC2 - Machinery, mechanical appliances, electrical/electronic articles AC8 - Paper articles
 AC11 - Wood articles
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of consumer exposure

Article categories	AC2 - Machinery, mechanical appliances, electrical/electronic articles
Covers concentrations up to	5.5%
Physical form of product	Solid, low dustiness
Amounts used	3E3 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Article categories	AC8 - Paper articles
Covers concentrations up to	0.4%
Amounts used	3E3 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Article categories	AC11 - Wood articles
Covers concentrations up to	5.5%
Amounts used	3E3 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Article categories	AC11 - Wood articles
Covers concentrations up to	1.3%
Use frequency	1 events per day

Article categories	AC11 - Wood articles
Covers concentrations up to	5.5%
Amounts used	1.3E3 g/event
Exposure duration	4 hours
Use frequency	1 events per day

Article categories	AC11 - Wood articles
Covers concentrations up to	1.2%
Use frequency	1 events per day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release

- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.0051 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00176 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Section 4 - Guidance to check compliance with the exposure scenario

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Section 1 - Title

Title Building and construction work
Type article
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Article categories AC4 - Stone, plaster, cement, glass and ceramic articles
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
----------	--

Control of consumer exposure	
Article categories	AC4 - Stone, plaster, cement, glass and ceramic articles
Covers concentrations up to	5.5%
Physical form of product	Solid, low dustiness
Amounts used	3000 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model		
Environment	predicted exposure level	Risk characterisation ratio (RCR)	

Freshwater	0.052 mg/l	0.018
Marine water	0.00512 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00352 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title paint and Coatings
Type article
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Article categories AC7a - Metal products: cutlery, cooking utensils, pots, pans AC8 - Paper articles
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
------	---------------

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
----------	--

Control of consumer exposure

Article categories	AC7a - Metal products: cutlery, cooking utensils, pots, pans
Covers concentrations up to	5.5%
Physical form of product	Solid, low dustiness
Amounts used	3000 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Article categories	AC8 - Paper articles
Covers concentrations up to	0.4%
Amounts used	3000 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

**Predicted No Effect Concentration
(PNEC)**

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00512 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00352 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Building and construction work
Type article
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Article categories AC4 - Stone, plaster, cement, glass and ceramic articles AC11a - Wood and wood furniture: furniture
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
----------	--

Control of consumer exposure

Article categories	AC4 - Stone, plaster, cement, glass and ceramic articles
Covers concentrations up to	5.5%
Physical form of product	Solid, low dustiness
Amounts used	3000 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Article categories	AC11a - Wood and wood furniture: furniture
Covers concentrations up to	5.5%
Amounts used	3000 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release

- ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00511 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00264 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Metal articles
Type article
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Article categories AC7 - Metal articles
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
----------	--

Control of consumer exposure

Article categories	AC4 - Stone, plaster, cement, glass and ceramic articles
Covers concentrations up to	5.5%
Physical form of product	Solid, low dustiness
Amounts used	3E3 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
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Freshwater	0.052 mg/l	0.018
Marine water	0.00512 mg/l	< 0.01
STP: Sewage Treatment Plant	0.00352 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Section 4 - Guidance to check compliance with the exposure scenario

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.

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Section 1 - Title

Title Paper articles
Type article
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 ERC11a - Wide dispersive indoor use of long-life articles and materials with low release
Article categories AC8 - Paper articles
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
------	---------------

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
----------	--

Control of consumer exposure

Article categories	AC8 - Paper articles
Covers concentrations up to	0.4%
Amounts used	3E3 g/event
Exposure duration	8 hours
Use frequency	1 events per day

Section 3 - Exposure estimation

Environmental release category(ies) - ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release
 - ERC11a - Wide dispersive indoor use of long-life articles and materials with low release

Predicted No Effect Concentration (PNEC)

Calculation method	Used EUSES model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.052 mg/l	0.018
Marine water	0.00508 mg/l	< 0.01
STP: Sewage Treatment Plant	0.000176 mg/l	< 0.01
Soil	0.141 mg/kg dw	0.025

Derived No Effect Level (DNEL):

Section 4 - Guidance to check compliance with the exposure scenario

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.